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FEBRUARY 1954

VOLUME 29 • NUMBER 2

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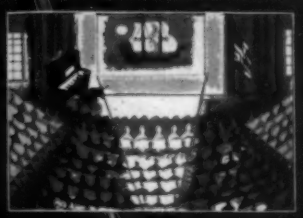

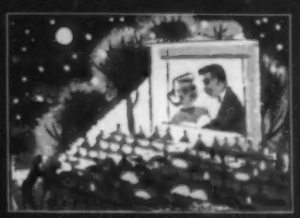

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American Cancer Society

INTERNATIONAL PROJECTIONIST

With Which Is Combined PROJECTION ENGINEERING

R. A. ENTRACHT, *Managing Editor*
JAMES MORRIS, *Associate Editor*

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Published Monthly by
INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.
19 West 44th Street, New York 36, N. Y.
Telephone: MUrray Hill 2-2948
R. A. ENTRACHT, *Publisher*

SUBSCRIPTION REPRESENTATIVES

AUSTRALIA: McGills, 183 Elizabeth St., Melbourne
NEW ZEALAND: Te Aro Book Depot, Ltd., 64 Courtenay Place, Wellington
ENGLAND and ELSEWHERE: Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2

YEARLY SUBSCRIPTION: United States and possessions, $2.50 (two years, $4); Canada and foreign countries, $3; single copies, 30 cents. Changes of address should be submitted two weeks in advance of publication date to insure receipt of current issue. Entered as second class matter February 8, 1932, at the Post Office at New York, N. Y., with additional entry at Yonkers, N. Y., under the act of March 3, 1879.

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MONTHLY CHAT

PROJECTIONISTS who remember the hand-crank, the milk bottle and projection room batteries of the old shooting gallery days may feel that they're playing at being Buck Rogers in this age of wondrous confusion. Mule team drivers must have felt that way when they saw the first locomotive belching its way across the salt flats. Lee DeForest, away back in 1907, must have wondered a little when, for the first time in the life of any man, he heard the human voice via the vacuum tube.

Now, in 1954, IP ponders the problem of "What hath Sarnoff wrought?" — or rather, Gen. Sarnoff's bright young engineers!

It is curious that every advance in applied science, including the modern miracle of the motion picture, had its genesis in the work of some pure scientist struggling to find out about nature and not caring a hoot to what useful purpose his discoveries might be put.

Sound motion pictures would be impossible if Clerk Maxwell in 1864 hadn't worked out his theory of electro-magnetic waves. Or if Sir. J. J. Thomson hadn't isolated the electron in 1897, paving the way for the cathode, the rectifier, the Tv kinescope and ten thousand other items.

IP, in a Nostradamic mood, is wondering (backed by engineering friends in the electronics field) about the newest RCA demonstration, a tube powered by Beta rays from atomic waste. Next month we'll carry an article on this new development and on its application in the projection room. Meanwhile, let's do a little preliminary wondering.

The RCA gimmick is a simple tube, with a radioactive electron source bombarding a transistor-like wafer acting as the cathode. The radioactive material takes the place of the heater in the tube familiar to every projectionist.

Imagine the perhaps not too distant future when no heating elements will be necessary in rectifier tubes! Think of the simplified circuitry! Ponder the ease and fidelity of sound reproduction and amplification when the power source becomes an absolute constant!

Strontium-90, the radioactive source material, is abundant and, as a waste product of America's expanding atomic program, its cheapness makes for its speedy utilization in industry, including the film business.

Less than a year ago few projectionists had ever seen magnetic sound tracks on film. Maybe next year, or the next, we'll be running our projection rooms with atomic power. Let's call up Mars and ask the engineers there about it. Or maybe we can call 20th Century Fox?

SEEING IS BELIEVING!

FAMOUS "FIRSTS"...

50 YEARS AGO, "THE GREAT TRAIN ROBBERY" ATTEMPTED THE FIRST COMPLETE, DRAMATIC FILM STORY. TO THE ENTERTAINMENT WORLD, A FLEDGLING GIANT WAS BORN.

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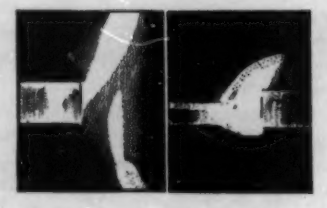

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VOLUME XXIX FEBRUARY 1954 NUMBER 2

This is the first of three articles

THE LENS: Key to Projection Quality

By ROBERT A. MITCHELL

A projection lens has no moving parts. It gets dirty and has to be cleaned at intervals; but there is nothing in it to wear out. When the focus is properly adjusted, the lens has nothing to do but "stay put" and "look" at the intensely illuminated photographs in the film-aperture. What the lens "sees" it paints with rays of light upon the large, distant screen.

Human vision is seldom perfect. Our eyes may be astigmatic, near-sighted, far-sighted, or have other things wrong with them which falsify our visual impressions of the world. And so it is with projection lenses. They too may suffer from various "visual" defects — spherical aberration, coma, astigmatism, field curvature, and other distortions. They may be unable to see the film-photographs as they really are, and accordingly mess up our screens with blurry, distorted images. But when the lenses function properly, the visual product captured on the film will be faithfully reproduced, its shortcomings as well as its merits.

Lens Is Everything

The projectionist understandably has a profound and tender respect for a pair of good lenses. He knows, as everyone else in the movie industry ought to know, that everything in a motion-picture production except the sound must pass through the lens of the projector. Many theatre-owners, profit-wise, are also aware of the importance of the projection lens; and they sagely seek the advice of the projectionist when considering the purchase of the new ones. Many theatre-owners, yes! But not all!

Penny-Wise Exhibitors

It might seem that no exhibitor would be so stupid as to consult an usher, a doorman, or a janitor about lenses. And yet that is exactly what some few exhibitors do. They allow themselves to be "educated" in projection technology by managers whose knowledge of motion pictures has been acquired on non-technical levels. The fellow who counts the pennies frequently draws no distinction between saving a shilling on lavatory disinfectant and practicing a similar "economy" on projection lenses. Ignorance has closed, not hundreds, but thousands of theatres.

A closed-until-further-notice sign on the door of a dark theatre may in about three out of ten cases be attributed directly to the type of exhibitor who expects the projectionist to "get by" with lenses that are chipped, cracked, heat-blistered, or just plain no good. Such an exhibitor blames his loss on Tv, high taxes, a mythical business recession, or almost anything except the real cause of his financial woes — the intolerably poor quality of his audiovisual wares. The moviegoing public can be lured into the "cheap" type of theatre only by unusually good films, a commodity too scarce to sustain the "dumps" through days and weeks of quite mediocre film-fare.

We do not want any theatre to close, but it does not surprise us when mismanaged theatres lock up for good. We dislike the idea of jobs being lost through the sins of managerial incompetents who do not belong in any theatre and would quickly ruin any business. It does not please us at all to see the public getting gypped by the "economists" who operate on a day-by-day basis and totally ignore projection, the one factor that often spells the difference between success and failure in the exhibition field. Only in projection are images dealt with, and it is only for the sake of images that cinema tickets are purchased. And the public today will pay to see only good images.

A Good Screen Image

The projectionist knows what constitutes a good screen image. He is the only employee in the theatre who knows on what factors a good screen image depends. He is not expected to possess the optical and mathematical knowledge of an optical scientist, nor is it necessary that he be capable of

designing a lens. He does not make projection lenses: he *uses* them! And he is the only person who uses them. And because of this, he knows that the performance of any lens depends in a great measure on the peculiar behavior of the intensely lighted and heated film in the projector aperture. His work thus involves certain practical aspects of lens-performance that cannot possibly enter into calculations of the optical designer.

The Basic Problem

The lens-designer, for example, goes on the assumption that the film-photograph in the aperture is a fixed, flat plane which, when the lens is in focus, coincides with one of the two conjugate focal planes of the lens (the other being the screen). The projectionist, however, is forced to deal with a film-photograph that flutters and practically never lies perfectly flat in the aperture.

The moment the rotating shutter opens to permit the light of the arc to strike the film, the center of the tiny film-frame begins to move along the optical axis either away from or toward the lens, eventually assuming the form of a pincushion. To get the best possible focus the lens must be moved to accommodate the pincushion-shaped photograph, but if the film flutters excessively even the best focus obtainable will not be very good and the screen image will be fuzzy.

Variation In Lenses

Projectionists who have operated in a large number of theatres and compared different types of lenses have found from actual experience that all makes do not give identical results.

Some give pictures of high contrast, but slightly blurry toward the edges of the picture. Other makes provide flatter fields, but with less sparkling contrasts. A third type may produce an extremely sharp image, but with a tendency to go out of focus easily; and a fourth type may give a softer focus that seldom requires refocusing for the focus-drift of the film. It will also have been noticed that coated lenses give much better images than uncoated ones, and that "fast" (F/1.8 and F/1.9) and short focus lenses (E.F. 1-½ to 3¾ inches) are sometimes rather troublesome.

The difference between a first-class lens and a poor one can be seen immediately, but the difference in the performance between two high-grade lenses of different makes is rather subtle. Differences do exist; and the projectionist is often correct when he maintains than one brand is better than another in the short focal lengths, while, perhaps, a third brand is superior in the longer focal lengths.

"Formulas" Vary

These differences are due to slight variations in the "formulas" used by different manufacturers for the same general type of lens, differences in optical glass, and differences in manufacturing methods. As a rule these variations are minor among American lenses, but rather pronounced among European brands. Some American lenses made before the war are not held in very high esteem, the English Ross and German Zeiss lenses of that era being preferred where quality projection really counts. Even though these foreign lenses are preferred even today by some exhibitors and projectionists, it is a fact that American optical manufacturers have produced projection lenses fully equal to the best European lenses.

The day of uncoated lenses is over; and there is no excuse for continuing to use them. Coated lenses provide images of increased brightness, clarity, and contrast. It is truly surprising what a difference the microscopically thin film of magnesium fluoride on the surfaces of the glass makes! It is too bad that good uncoated lenses must be discarded; but keeping them in service compromises picture-quality. Very few exhibitors can really afford to do that! Unfortunately, old uncoated lenses cannot be coated because the slight corrosion of the glass surfaces prevents an even distribution of the antireflection film.

"Short" and "Fast" Lenses

The greatest differences in the performances of lenses are undoubtedly due to differences in focal length, the shorter the E.F. (equivalent focal length'), the greater the focusing difficulties caused by optical aberrations and by flutter and buckling of the film in the aperture. Then too, the faster (larger) the short-focus lens, the more trouble it gives the projectionist.

A few theatres must use short-focus lenses because of purely local conditions. The projection room may be located at the edge of a deep balcony, for example, and be so close to the screen that short-focus lenses are necessary for a picture of adequate size. But a larger number of other theatres needlessly employ short-focus lenses. A picture which is too small is a bad thing; but a picture which is far too big is much worse!

Neglecting CinemaScope and other wide-screen processes for the present, it may be said that the width of the picture should be about 1/5 of the projection throw. This size of picture is obtained with 4-inch lenses. It is quite all right to use 4-¼-inch lenses for a picture just a few inches smaller, though to use 3-¾-inch lenses to get a slightly larger picture is inviting trouble.

Screen Size Importance

The size of screen suitable for a specific auditorium should be very carefully chosen in order to avoid a picture which is too large or too small. Actually, most theatres have screens which are a trifle too small. Unless the theatre is a long, narrow one, it is a safe bet that the picture is too small if lenses of longer focus than 4-½ inches are used. The best time to enlarge the picture is when the purchase of new lenses is contemplated. A new screen will probably be desired anyway. Order a screen 2 feet wider and higher than the new, larger picture, and there will be plenty of leeway if a slight error has been made in measuring the projection throw (distance from aperture to screen).

If the new picture is vastly oversized, however, extremely powerful lamps and very short-focus lenses are required. This combination is death to top-notch projection. Short-focus lenses show up even the smallest traces of film-flutter as a blur, and high-powered lamps under such circumstances, only increase the flutter. It should also be remembered that lenses of very short E.F., especially if fast, do not give such sharp images as lenses of normal focal length. In addition, oversized screens require magnification of the film-photographs to the point where they appear grainy and fuzzy to patrons seated in front seats.

Not only are the film-frames buckled into the shape of pincushions by the heat of the arc, but the film may also be twisted or warped at the aperture by worn film-runners or "pinched" by improperly adjusted guide-rails or

(Continued on page 34)

That Hardy Perennial: Damaged Film!

CinemaScope and 3-D have aggravated an age-old controversy—the projectionist versus the exchange. Who's to blame when a show goes berserk because film breaks? Or when other damage, perhaps unavoidable, sends tempers soaring?

By JAMES MORRIS

PROJECTIONISTS are often irritated by what they feel is a lack of cooperation on the part of the film exchanges. One recent letter received by IP from a projectionist on the West Coast concerned an argument with an exchange there over a new print with nicked sprocket holes which the exchange insisted had been mutilated by improper threading of the projector. The projectionist, equally vehement, was sure that the exchange was wrong. Who's to blame? IP, in the projectionist's corner, thought it was about time we had another look at the problem of film damage.

Another letter from a projectionist concerned the large number of puzzling and messy cue marks on old prints coming his way from the exchanges.

When 3-D pictures were making their first appearance at both exchanges and theatres, the fur flew thick and fast, with both sides accusing each other of perfidy, neglect — or worse. However, in the case of 3-D both sides had somewhat valid alibis. Manpower on the exchange side was short, woefully short. And on the theatre side, few and far between are exhibitors who are willing to spend the money for proper inspection of the twin 3-D films by their projection staffs *before* the film is run for the first time.

Inspection Inadequate

IP has constantly, both in the "Monthly Chat" column and in other editorial columns, brought out the often inadequate practices of the exchanges. In fairness, we'll give the exchange people a chance at bat in this article.

An interesting insight into thinking at the exchanges can be gained from the remarks of one inspection room chief to IP. He wanted to cooperate with the projectionist and insisted that nothing could be gained by hurling accusations back and forth.

"What the projectionist should do," he said, "is check his print before he runs it and, if it is a bad print and if the time element allows, send it right back to the exchange and demand a new one. There's no point in running a bad print and then cursing the exchange when a break or other damage occurs.

"If the projectionist did this, he would be accomplishing two things. First, he would be clearly establishing that the damage did not occur in his theatre. Second, and even more important because it could lead to better service in the future, the projectionist's efforts might help in forcing the big bosses to hire more inspection personnel."

Too Many Layoffs

While talking, this man pointed to the inspection room at his exchange. Only half the tables were in operation. A number of inspectors had been laid off in recent months with poor business used as an excuse. However, even when business was good and the exchange was running full blast, the inspectors were in no position to properly examine all prints.

In many cases prints coming into an exchange today are merely labeled "checked" and shipped to the next theatre. When a print is actually inspected, an hour is the time often allotted for the complete inspection and repair of a feature film in fairly good condition. Properly and thoroughly done, this job could easily take three hours, it was estimated.

One cause of confusion among exchange personnel over the cause of print damage is the fact that they do not have the intimate knowledge of the motion picture projector that would enable them to understand that the most careful and alert projectionist will have plenty of trouble if it is necessary for him to work with poorly inspected prints and worn equipment that includes components such as sharp, hooked sprocket teeth.

According to exchanges, the most common types of film damage are: (1) vertical scratches or lines on the film; (2) bad splices or splices out of alignment; (3) "runoffs," or holes made by sprocket teeth in the picture area; (4) nicks and breaks in the sprocket hole area, and occasionally, (5) messy cue marks such as holes or slashes at the end of a reel.

Vertical Scratches

Vertical scratches, or lines running up and down the film on both the emulsion and support side, were regarded as the most common type of damage that film receives in the pro-

"Runoff," as illustrated above, is a common type of film damage that occurs when the film jumps a sprocket because of a stiff splice or some other reason. Long lengths of film are often damaged when the sharpened sprocket teeth cut holes in the soundtrack and picture.

jection room. The most frequent cause of this damage is in the valve rollers of the magazines, particularly the upper magazine, which is the first point of contact between projector and film after it leaves the feed roll. Dirt, oil and small pieces of film can accumulate at this point so as to prevent the free turning of the rollers, even preventing one or more from turning at all.

Another frequently-found type of film damage is nicked or broken sprocket holes. This was the kind of damage mentioned in the letter referred to in the first paragraph of this article. Such nicks usually indicate too much tension. The rub, of course, is what caused the tension? New prints in which the emulsion is not fully set, when exposed to the heat of the gate, very often become sticky and create tension which, in turn, causes the nicks as the film goes past the intermittent sprocket. Once the print has been seasoned a little, this trouble is eliminated.

Excessive tension at the film trap causes wear on both the projector movement and film. The sprocket teeth of the intermittent are more quickly worn out of shape. Tests by Eastman Kodak indicate that complete, equalized trap tension in excess of 16 ounces is unnecessary and only increases wear on film. Settings as low as six ounces, in some cases, seem to give a steady screen image.

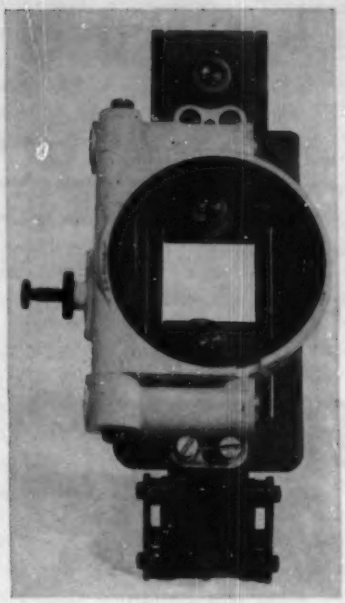
Another cause of nicked sprocket holes, and also of completely broken film, is faulty threading ot the projector which results in the loop being lost at one of the sprockets while framing.

When the excessive tension at the film trap is the basic cause of nicks in the sprocket-hole area, the damage is actually caused by the teeth of the intermittent sprocket which can be worn into a hook-like shape or develop other malformations as a result of excessive tension when the film is pulled down. A tooth of this type will tear small pieces of film from the pulldown edges of the perforation.

Knife-like edges on the teeth of the intermittent sprocket is another type of tooth deformation that results from contact with the inside walls of the intermittent guide or shoe. Such teeth make small straight cuts parallel to the edge of the film on the pulldown edges of the perforation and well in from the corners. These small cuts can quickly lead to the breaking-off of the edge of the film.

"Runoffs," which are, of course, the gashing of the track and picture area, occur when film jumps a sprocket because of a stiff splice or some similar reason. It can also result from faulty threading. In addition to defacing the picture, these repeated gashes weaken the film in such a way that subsequent bending of the edges will often break it.

In order to minimize the danger of runoffs, it is advisable to check regularly the clearance between rollers and sprockets to see that rollers are holding the film properly in place but without pressure.



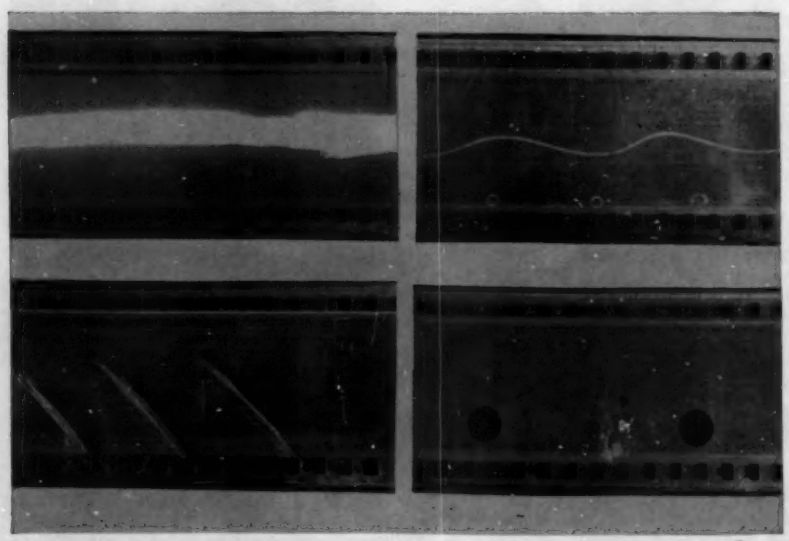
Tension adjustment on the newer projectors has been greatly simplified by the cone-shaped tension springs as illustrated above. Excessive tension from the film trap can cause much wear on the projector and prints.

Prints are often encountered where the film is bent between the perforation and one edge. Known as "idler cramping," this type of damage can be especially harmful with brittle film and when the bend is against the emulsion side. Long edges can be broken off completely. Usually starting at an edge break or loosened corner of a splice, this trouble most often occurs on the first pad roller of the intermittent loop.

Bad splices — splices where a proper joint is not made and splices that are out of alignment — are a principle cause of "beefs" from exchanges as well as from projection rooms because they lead to extra work or else to torn, broken or gashed film. "I want to know what kind of splicer some projectionists use," one inspector asked. "Do they have a bench splicer like the Griswold or do they splice by hand?"

In answer to this remark it can be said that not every splice on present-day film is going to be perfect or hold indefinitely. Exchanges which inspect prints hurriedly or don't inspect them at all, or even, as in some areas, go so far as to "bicycle" them directly from theatre to theatre, have themselves to blame when bad splices cause serious

(Continued on page 28)



Four samples of unsightly changeover cue marks sometimes found at the end of reels are shown above. This type of damage is not nearly as common as it was some years ago and is generally found on old prints that have seen a great deal of use in many theatres over a long period.

Lamps that are SCREEN ENGINEERED

Lamps are selected on the basis of the prevailing or desired screen size.

While lamps such as the Super "135" work admirably on any size screen, they are unnecessary with small-size screens. Similarly, the Utility 1 KW lamp puts a "cheaper" light on a giant-size screen, but the results are unsatisfactory.

That's why Strong has designed a full range of lamps to exactly fill the requirements for screens of all sizes. Every Strong lamp is engineered for maximum efficiency under a specific set of conditions. The accompanying chart will help you determine your requirements.

Strong LAMPS are NEVER EQUALLED and there's a Good Reason!

As the only lamps produced complete within one factory, Strong lamps can be engineered to obtain the highest efficiencies ever attained.

With Strong, designing equipment for projecting light is a science and a business. That's why more dealers sell and more theatres buy Strong-made projection arc lamps than any other make.

PROJECTION ARC LAMP RECOMMENDATIONS

FOR THE VARIOUS PRINCIPLES OF PICTURE PRESENTATION BY INDOOR THEATRES AND DRIVE-INS

INDOOR THEATRES

For Screen Widths Up To:	2-D Matte Screens	Dual Film 3-D Projection	Single Film 3-D Projection	Wide Screen Aluminized	CinemaScope
20 feet	1 KW	Mogul	Mighty 90		
25 feet	46-Ampere	Mighty 90	Mighty 90	1 KW	
30 feet	Mogul	Mighty 90	Super 135	46-Ampere	
35 feet	Mighty 90	Super 135	Super 135	Mogul	Mogul
40 feet	Super 135	Super 135		Mighty 90	Mogul
45 feet	Super 135			Mighty 90	Mighty 90
50 feet				Mighty 90	Mighty 90
55 feet				Super 135	Mighty 90
60 feet				Super 135	Super 135
65 feet				Super 135	Super 135
70 feet					Super 135

DRIVE-IN THEATRES

30 feet	46-Ampere	46-Ampere	Mogul		
35 feet	46-Ampere	Mogul	Mighty 90		
40 feet	Mogul	Mogul	Mighty 90	Mogul	
45 feet	Mogul	Mighty 90	Super 135	Mogul	
50 feet	Mighty 90	Mighty 90	Super 135	Mogul	
55 feet	Mighty 90	Super 135	Super 135	Mighty 90	
60 feet	Super 135	Super 135		Mighty 90	Mogul
65 feet	Super 135	Super 135		Mighty 90	Mogul
70 feet	Super 135			Super 135	Mighty 90
75 feet	Super 135			Super 135	Mighty 90
80 feet				Super 135	Mighty 90
90 feet				Super 135	Mighty 90
100 feet					Super 135
110 feet					Super 135
120 feet					Super 135
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Proper Tools a 3-D 'Must'

Third dimension pictures triple projectionists' problems, says Stanley Cohen, Polaroid expert who has some hints for better 3-D presentations

By STANLEY COHEN*

THE BEST CRAFTSMAN in the world can't do a top job unless he has the proper tools and good materials with which to work. Projectionists who have struggled with the third dimension and, in spite of their best possible efforts, have listened to frantic calls from "downstairs" that people were demanding their money back, will know the truth of that statement.

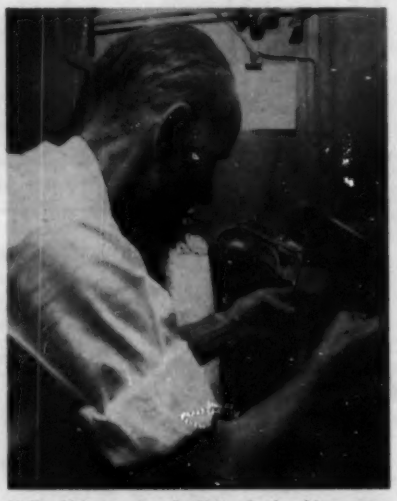
This writer has covered thousands of miles and visited projection rooms in dozens of cities, all in the interest of good 3-D presentation, a subject about which my company, the Polaroid Corp., is not exactly unconcerned. We're in the 3-D business up to our ears — and it's good business for us to have the best possible presentation of pictures in the medium. Hence this report to the craft on my own observations.

To begin with, 3-D with the twin films does not double the things a projectionist must check during presentation. It triples them!

Rebirth of 3-D

Polaroid Corp. is going all the way to give 3-D a technical shot in the arm. The object, of course, is to obtain perfect projection (such projection is now commonplace) of stereoscopic motion pictures. To that end the company several months ago started an extensive institutional program. Known as a "technical service program," it was first tested in the Boston and New York areas and then extended to other parts of the country. The goal is to reach, in one way or another, each of the 5,000-odd projection rooms in the country where facilities for 3-D presentations now exist.

After a few months of intensive field work, together with research, development, manufacture, distribution and training, we feel that our efforts have been rewarded. 3-D presentation today is immeasurably better than it was during the early stages of 3-D when projectionists literally had the twin reels thrown at them. They had to teach themselves, adjust to the new medium and put on a show without the proper tools,



Neils Hoiness, Local 306, checks his screen with a stroboscope at Loew's State, New York.

often with banged up prints that would have baffled the genius of a Houdini. Projectionists took the situation in stride without encouragement, without sympathy and, quite often, without explanations. Under these circumstances they have done a surprisingly good job. We at Polaroid like to think that our 3-D projection kit has made life a little easier.

The 3-D Sync Kit

Briefly, the kit includes high quality filters for mounting at the ports, a stroboscopic sync monitor and a sync control. The latter is wired between the selsyns of the two projectors and has a knob which permits relative adjustments in 1/6 frame steps. Used together, the monitor and the control enable the projectionist to discern and correct variations down to 1/12 frame. To detect variations greater than one frame, a window with a tell-tale filter is mounted on top of the monitor unit. This filter, which presents the two images of the right and left projectors as overlapping images of red and green respectively, permits the projectionist to determine which projector is running visibly ahead of the other by seeing which color is leading the other in fast-action scenes. Use of the sync control easily brings the two film strips to within one frame of each other. Mis-synchronization is then further corrected by lining up the strobe stripes.

Projectionists visited on our field trips were cooperative, enthusiastic men who were trying to put on a good show with new and complicated tools and often under the most adverse conditions. Let's look at some of the problems this writer met in projection rooms up and down the country:

Tell-Tale Filter

Suppose your picture gets out of sync, you look into the window of the monitor and observe that the stripes line up. You look at the screen and see slightly watery images. Now you try the tell-tale filter atop the stroboscope and discover that the two images, red and green, are not moving simultaneously but are so close you cannot tell which is leading. You know two things for sure: first, because the strobe stripes line up, you know that the error is in whole frames, and, second, the error is probably one or two frames, no more. To correct, you turn the switch one complete turn, that is six snaps, in one direction. If the sync looks perfect in the tell-tale and with your 3-D glasses on, you have corrected a one-frame error. If it looks better, but not perfect, you continue in the same direction one more full turn of six snaps. Now sync should be perfect.

If turning the control in one direction makes sync look worse in the tell-tale, you simply go back to where you started and then make one complete turn in the other direction. When you become familiar with the equipment, and can recognize a one-frame error, correcting it becomes routine. The whole procedure can be carried through in a matter of perhaps 30 seconds.

A one-frame error may be due to a number of things: improper syncing of the film at the exchange or in the projection room; improper threading, or framing to correct vertical displacement on the screen. Actually, all

* Mr. Cohen is a technical representative for the Polaroid Corp., Cambridge, Mass.

of these can be avoided. It is common practice in many projection rooms for two men to switch machines before starting in order to check each other on start marks, loops, flywheel sync marks, etc. Every 3-D film should be tried on a dry run before the opening day and, of course, the same applies if replacement prints come from the exchange. If prints are out of sync, the time to find out and to correct errors is before the first ticket is sold at the boxoffice.

The Kit in Action

An example of the 3-D sync kit in action was seen by one of Polaroid's men in a projection room in Connecticut. There was a film break and, in splicing, one foot of film had been left out of one of the mates, an error that could, and does, happen very easily. When the picture hit the screen the sync was out by 16 frames. Sixteen full turns of the control, six snaps to the turn, and the picture was perfect again in less than two minutes.

This writer was present in the projection room at an important preview in Chicago when the intermittent sprocket sheared its retaining clip on one of the projectors. Fortunately, the circuit technician was handy and he repaired the machine in five minutes. Just six minutes after breakdown the picture was brought back into sync.

In New York, at a key opening, a vertical frame error occurred when the second pair of machines was turned on. The right projector was framed down quickly. But framing the picture had produced a one frame sync error which was corrected in 25 seconds.

The above instances are given to show how simply matters can be handled when things go wrong, provided the projectionist has the right tools and provided he has the know-how.

Some projectionists have expressed concern over a slight jog in the stripes of the strobe monitor, that is, black lines are over black lines and grey lines are over grey lines but they do not line up perfectly. This is due to backlash (electrical wind-up), or to gear slippage in the system, and is nothing to worry about. The error is perhaps 1/12 of a frame and is as close to perfect sync as is necessary. It is possible, too, that the shutters are not in exact alignment. This can be easily adjusted.

Bad sync is not the only problem in projection of 3-D. Focus, variable brightness, clean and level filters, image registration and proper carbon trim are other things to watch for. Focusing is simple with Polaroid focusing filters, and the projectionist should make a check after starting each reel. Field glasses, even inexpensive ones, are a great help in focusing and close reading of the screen. From the orchestra floor detecting bad focus is even simpler by alternately closing one eye and then the other while wearing 3-D glasses.

The two images should be as nearly equal in brightness as possible. The Polaroid brightness matching filter is helpful here. Carbons should be feeding properly and with the proper arc adjustment for equal burning. In some color prints the color values vary between the two images. This may cause an apparent difference in brightness which may alternate with scene changes. Correcting the lamps for one scene may cause the next scene to go off. This is another good reason for a dry run before opening with new prints.

Filters and Targets

Projection filters should be checked for power of blackout. When the polarizing axes of the filters are crossed at right angles, transmission should be nil except for a dim violet light that may get through. Polaroid No. 750 filters are specially designed and manufactured for perfect 3-D projection because we know from sad experience that filters of poor optical quality can play havoc with projection. You can check optical quality by such tests, for example, as holding the filter at arms length and sighting an object through it with one eye. If the object seems to "worm" or jiggle when the filter is moved slowly up and down, the filter is faulty.

Projection filters should be horizontally level and in this a spirit level is a mighty useful tool to have around. If the projection angle to the screen is greater than 20 degrees, it is a good plan to bring in the bottom of the filter in order to have the filter perpendicular to the beam as closely as possible. Most important of all, however, is to have clean filters. It is wise to check them before each 3-D engagement and change them when scratched or oily.

Perhaps the problem getting the least attention in 3-D is image alignment. The cameramen taking stereo movies give the two images the proper horizontal displacement (interocular) by adjusting the camera lenses. The films are then printed carefully so that this interocular displacement is retained. Therefore it is essential that the two projector beams be exactly superimposed on the screen. This can be done only by using lenses of matched focal length and by running target films. There must be no vertical nor horizontal displacement of the target patterns.

Some target films are not symmetrical. That is, the pattern may be closer to one edge of the film than the other. Therefore it is necessary to thread both target loops with the patterns on the same edge.

If the picture has a vertical displacement the patrons' eyes try to twist, one up and the other down. If the horizontal displacement be too great, or too little, the 3-D depth effect may be altered or lost entirely. A vertical error may be corrected by framing one or both projectors, but always check the sync after correcting a framing error. Framing may cause one picture to advance by one or two frames and this becomes a sync error.

One-Eyed 3-D

On occasion a carbon may burn out while showing a 3-D film. When that happens people are watching a flat movie with only one eye. The other eye is blacked out. This, of course, is a very disturbing situation giving rise to headache. If a carbon burns out, the first thing to do is to remove the filter from the port where the picture is still going. This will allow the theatre patrons to see 2-D with both eyes until the burned carbon has been replaced. Then douse the "dead" projector. When the carbon has been replaced, put the filter back in the port where the picture is on and then fire the other machine.

It seems that there are many things to do in order to give a good 3-D show. These things, however, become routine once the tricks are learned.

Before writing "finis" to this little exposition, this writer, on his own behalf and on behalf of Polaroid, would like to thank the projectionists, the technicians and the service company field engineers, and all others who have given us such whole-hearted cooperation in making 3-D an attraction calculated to bring more people than ever into the theatre.

Atom-Smasher Principle Aids Color TV

Projectionists very much in the picture as color TV gets off to a hesitant start with the Cyclotron idea of electron acceleration spurring new controversies

By FREDERICK HODGSON

PROJECTIONISTS who have watched technological advances turn the motion picture industry topsy-turvy within the past twelve months may spend a profitable and enlightening moment considering the effect of progress in other fields, color television as the top example. If any there be who think that Tv in rainbow hues has nothing to do with the film business, let them read this month's "Spotlight" in IP and ponder some of the data recounted there.

This brings us back to the subject under discussion in this series of articles, color television at the receiving end — the cathode tubes, or kinescopes, that bring the show into the living room and will eventually bring Tv into the theatre. Either way, the projectionist is very much in the picture.

Last month we discussed very briefly the three kinescopes so far entered in the color television sweepstakes, the three-gun RCA and CBS tubes and the simpler one-gun Chromatron developed by Paramount-owned Chromatic Laboratories.

Atom-Smasher Principle

The Chromatron, devised by Dr. Ernest O. Lawrence, inventor of the atom-smashing Cyclotron, makes use of the Cyclotron principle of high acceleration voltage to fire the picture-carrying electrons from the cathode at ultra high speeds into the phosphor strips of the face, or picture, plate of of tube. Let's pick up where last month's article left off and examine a few of the differences between the three top kinescopes so far announced.

Some Chromotron Details

The basic differences between the Chromatron and the CBS-Hytron and the RCA tube have been recounted previously. It remains now to cover details of the Chromatron, some of them shared with the other kinescopes.

The Chromatron uses a flat viewing plate with more than 1,000 phosphor strips placed horizontally across the back for the 21-inch picture size. The color scheme used is red, green, blue, green, red, green, and so on, every second strip being green. Other combinations might be used for the strips, provided every other strip were of the same color phosphor. Back of each red and blue strip (none for the green) is a fine wire carrying the voltage which switches the electron beam to the proper color.

There has been some criticism of the Lawrence tube on the score that the voltages necessary for its operation are too high. In truth, the Chromatron anode voltage is 18,000, which is the same or less than, with either the RCA or the CBS tubes. Voltages must correspond for the high velocity electron beam and for the control grid wires.

Too, it has been asserted that there

This is an early experimental Chromatron, or Lawrence tube. Production models for 21" and 24" color pictures will be rectangular at the face plate instead of round. Note the short distance between the cathode in the neck of the tube and the phosphor face plate.

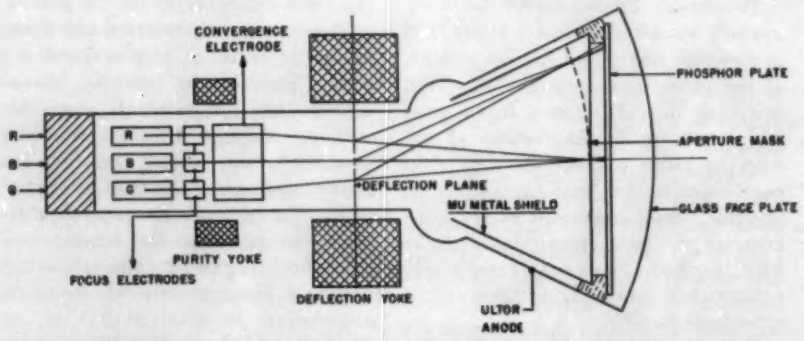
is a loss of electrons caused by the grid wires and that this results in a loss of picture brilliance. IP fails to see how this loss of 15% or less in electrons can be a greater disadvantage than is the obviously much greater loss of electrons caused by the perforated metal masks of the RCA and CBS tubes. Some electronic engineers place this loss as high as 85%, a figure vehemently denied by RCA spokesmen.

Aperture vs Grid

In the Lawrence tube the electron stream from the single gun is bent around the grid wires to hit the proper phosphor strip. In the aperture or perforated masking plate type of tube there is no bending effect, part of the electron stream being stopped dead by the metal plate. Only that part of the beam passing through the perforations is of any use in bringing the color picture to the screen. Even a casual study of the illustrations accompanying this article will make the point clear.

Stated as briefly as possible, and closely quoting Chromatic engineers, claims for the Lawrence Chromatron are:

1. Wide deflection angle. This is 72 degrees, making it a short tube. The overall length for a 22½-inch picture is 22 inches, comparing very favorably with the length (from the



Above is a simplified cross section of the present RCA three-cathode (or gun), tri-dot kinescope, or receiving tube. Note the length of the tube in contrast to the other tubes illustrated.

face plate to the back of the cathode in the neck of the tube) of your 21-inch black-and-white set at home.

2. Large picture. Over 60% larger than pictures produced by three-gun shadow mask tubes of the same dimensions.

3. Bright picture. At an anode voltage of 18,000, the brightness measured through 66% efficient filter face plate is above 50 foot lamberts in the highlights.

4. Low raster (image) scanning power. The deflected beam is one quarter the potential of the final acceleration.

5. Resolution. In the horizontal direction definition is equivalent to black-and-white. In the vertical it is limited only by the number of color strips.

6. Standard deflection components. The tube uses standard low-cost black-and-white magnetic deflection yoke and standard magnetic focal coils.

7. Quick set up. This is done in a matter of minutes since there are no problems of raster registry or dynamic convergence. This is in contrast to other tubes.

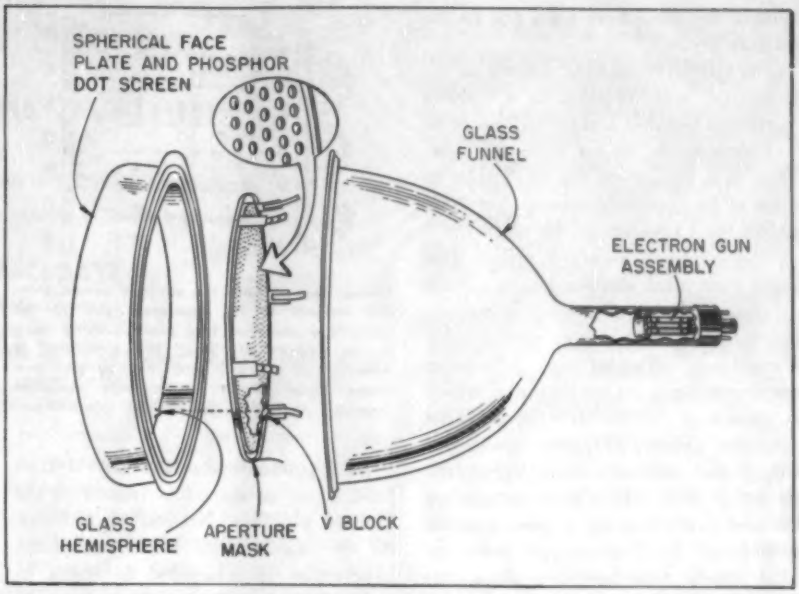
8. Simplified circuitry. This is because the Chromatron is a one-gun tube, not three.

Other Advantages Claimed

In addition to the above, Chromatics engineers boast of fringe-free color pictures and fringe-free reception of black-and-white. They claim that the tube is relatively inexpensive to produce because of several factors, notably because of the single gun, the standard magnetic yokes and the fact that only reasonable production tolerances are required. Alignment of the Chromatron is extremely simple.

The Lawrence tube illustrated with this article is an early experimental type, no pictures of the new tubes being available as IP goes to press. The new tubes are rectangular at the face, rather than round. It is pointed out by practically all concerned in the development of color television that the present production bottleneck is the shortage of envelopes, the glass bottle of the tube.

An indication of the expected demand for Chromatron tubes is found in Chromatic Laboratories' action last month in setting up new facilities for grid production at the company's plant in Emeryville, Calif. This new plant, scheduled to employ some 200 people at the start, will be in production by the end of March with an initial capacity of 25,000 grids per year. CTL has been making grids for licensees and potential licensees in a pilot plant connected with the company's Oakland laboratories.



Above is an "exploded" diagram of the CBS-Hytron tube showing the three-gun assembly inside the neck of the envelope. Note that the phosphor screen is on the face of the tube itself.

Start of mass production of the Lawrence tube and delivery to set manufacturers for enclosure in cabinets with the necessary electronic units for its operation should come quickly, according to Chromatic Laboratory's president, Richard Hodgson. At this writing two manufacturers, Crosley and Thomas Electronics, Inc., of Passaic, N. J., have been licensed to produce the tube. The Thomas firm, said to be the largest manufacturer of cathode tubes in the country, is picture tube supplier to most of the major producers of Tv sets.

Some further, and a bit more technical, information on the Lawrence tube might be of interest. An examination of the diagrams will show that the wires behind the red phosphor dots are electrically tied together and are brought to a single terminal at the side of the tube. In the same manner the wires behind the red phosphors are tied together and brought to a second terminal. There is a third electrode for the aluminized backing of the phosphor plate.

As stated previously, a focusing and acceleration potential is applied between the electrical center of the wire grid and the aluminum coating. This creates the electrostatic lens, or rather series of lenses, in the front section of the tube. As electrons stream down the length of the tube from the single cathode gun perpendicular to the image plate, they are focused sharply by this series of lenses to the green strips between each red and blue strip, when there is a zero potential between the red and blue termini of the wire grid. Thus a green raster appears on the image plate.

At this point, to quote Robert Dressler,* director of research and development at Chromatic's New York Laboratory, "a potential difference may be applied between the sets of wires to deflect the focused beam in the direction of the positive wires. This voltage can be made of such a magnitude that the beam will strike a phosphor strip adjacent to the green, thus rendering a red or blue raster on the image plate, depending on which set of wires was positive. Separate colors, therefore, can be displayed by simply changing the potential of these wires. With a color switching device of this type, the color displayed depends only on the potential of the wires, so that no color distortion or contamination can result from nonlinear sweeps or minor inaccuracies in gun position. In addition, the cylindrical lenses up front focus the beam of electrons into a spot so fine as compared with phosphor strip width, that the placement of wires

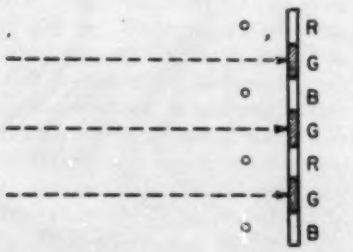
* In a paper read at the July, 1953, meeting of the Institute of Radio Engineers.

behind the phosphors need not be extremely critical."

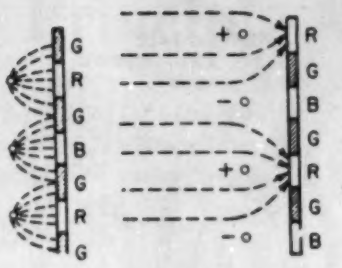
The CBS-Hytron tube, known as the Colortron, was unveiled to a waiting world last October and turned out to be a shadow mask, tri-dot three-gun tube. Thus it is similar to the RCA tube in some of its important aspects, but quite unlike the Chromatron. Its main point of distinction is a curved rather than a flat type mask designed to minimize or completely eliminate color convergence. This latter simply means color registration. Production differences are also announced for this tube, which is shown in "exploded" form in the diagram (Page 15), the main one being the method of applying the phosphor dots. This is accomplished for the Colortron by a photographic technique. In the case of both the RCA tubes and Lawrence tube, the Chromatron, application of the phosphors is by silk screen, although individual manufacturers of these tubes may elect to use other methods.

Too, the Lawrence tube has been criticized to the effect that the phosphor strips are visible to the viewer and do not give the smoothness of either the RCA or the CBS-Hytron. It is argued that the 1,000 or so phosphor lines, each 15 mils wide, cannot compete with the million phosphor dots. The reader can judge for himself by simply watching color television on the three tubes and contrasting the performance of each.

Feel this page of IP for thickness and you'll have an idea of the width of the phosphor strips. This page is approximately 2½ mils thick. Therefore, roughly, the phosphor strip of the Chromatron is six times as wide as the page thickness. Chromatic engineers are working on methods which they hope will reduce the strip width to 10 mils or even less. Ten mils, of course, is one one-hundredth of an inch.



The sketch shows how electrons from the cathode of the Lawrence tube, travelling thousands of miles per second, strike the green phosphors without hindrance from the grid.



Shown here is how the electron stream from the cathode of the Lawrence tube to the aluminized phosphor face plate is acted upon by an electrostatic "lens" (the grid) and is deflected at the grid (indicated by plus and minus signs) to the appropriate phosphor strips. Note that the polarity alternates.

Pilot production of the CBS-Hytron tube is set to start this month at the Hytron plant in Newburyport, Mass. At the Kalamazoo, Michigan, plant, production is scheduled to begin in September.

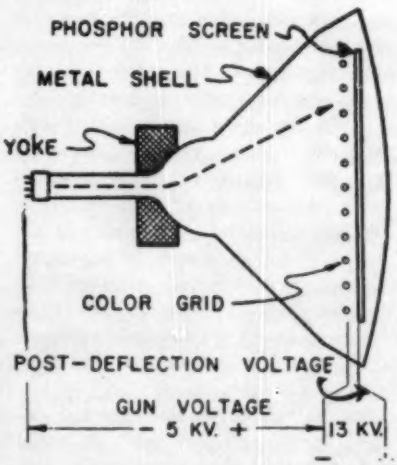
Bruce A. Coffin, president of the CBS-Hytron division of the Columbia Broadcasting System states that emphasis will be placed on production of 21-inch rectangular models. Hytron tubes seen by IP have been round, very likely due to the same bottleneck in the glass envelopes that is plaguing other manufacturers.

The Hytron tube has a metal face mask held from the flat glass phosphor plate by a spacer frame. This is to maintain a rigid relation between the perforations of the mask and the related phosphor dots which are planted directly on the inner face of the tube. This latter trick has the advantage of keeping down the weight of the tube. The tube, so CBS claims, does not require the high vacuum of the RCA tube, an important cost factor in manufacturing.

An interesting point of difference between RCA and CBS is the fact that the latter clings tenaciously to its field-sequential system in transmission. RCA uses a three-tube, or three orthicon, taking camera. Dichroic mirrors split the color image into its red, blue and green components, then reflects the beams through color-selective filters to the trio of orthicons, whence they are fed to the adder, then encoder and the transmitter. CBS, on the other hand, uses but one taking tube but splits the image into its component colors by means of a spinning color wheel. The alternating red, blue and green impulses are then carried to an ordinary black-and-white tube, a system of mirrors picking up the color and picture information from there and reflecting this information triad into three color tubes, one for red, one for green, and one for blue. Each of these tubes has a shutter synchronized with the color wheel (doubtless by selsyn interlocks). The information is then carried through the rest of the broadcast circuit and out onto the air as a compatible picture.

Incidentally, the field-sequential system, now passe with the adoption of the NTSC standards, simply fired the pictures at the receiving tube in a rapid succession of color messages. These could be separated at the receiving tube by means of a color wheel. Such a system was incompatible because color television could not have been picked up by the present black-and-white sets. Nor could color sets built for field sequential reception pick up the present black-and-white telecasts.

An interesting sidelight to the sudden furor over the advent of commercial color television is RCA's interest in projection color television. The reason is easy to figure out. The three-tube projection system of the RCA laboratories projects images through a special optical system onto an 18 by 24 inch translucent screen. For a picture of similar size on the RCA color tube described earlier in this article, the tube would have to be nearly three feet in diameter. This experimental projection of color television has been demonstrated by RCA on full-size theatre screens.



This is a cross section of the Lawrence, single-gun Chromatron tube. Note how the electron stream inside the shell is deflected by the coil magnetic yoke. Note, too, the placing of the wires of the color grid in relation to the phosphor face plate. The 13 KV post deflection voltage from the grid "lens" varies.

Light Gain, Better Screens Demanded by New Systems

So-called "all purpose" screen for CinemaScope 3-D and wide-angle projection is industry need

By LEONARD SATZ
Raytone Screen Corporation

THE SUDDEN importance of wide-screen, 3-D and anamorphic presentation in our industry has created a critical need for more efficient screens. The interpretation of "more efficient" will vary a good deal in the considered opinions of many experts and has, indeed, caused quite a stir.

One fact stands out above all others. More light is required from the projection room and higher brightness is a must as far as the reflectivity of the screen is concerned if acceptable standards of projection are to be maintained. (See table.) How much more light and how much higher gain, and the distribution of these qualities in any theatre, is a question that has been bandied about with too much apparent positiveness by some, and without due regard for actual results in the theatre auditorium.

3-D Needs Most Light

A so-called all-purpose screen is now in demand. The screen manufacturer must carefully consider the requirements — facility to show 2-D, 3-D, wide-screen and anamorphic systems. The least amount of light gain is required by the anamorphic system since its lenses transmit wide-angle lighting more efficiently. but this gain is somewhat tempered by the fact that two lenses are needed. A regular lens plus the attachment of a six-element anamorphic lens results in slower speeds and light losses because of reflection at extra lens elements. However, the system still transmits more light than any other wide-angle technique.

3-D on a wide-angle screen requires the most light. Here, according to unquestionable authority, brightness gains on the order of five times are required to overcome the deficiencies of polarizing porthole filters and audience viewers. A compromise is in order, and the writer believes in brightness gains of approximately three. In other words, the screen must be capable of reflecting 300 percent more than a white screen at peak performance. No screen can do this at all angles — here one must be practical.

Brightness curves or graphs are like electrical characteristic curves for the tuning of a sound system. With the latter, add high frequencies and it is the same as eliminating the lows. With the former, add brightness at the sides and the center will suffer. Add too much in the center and the sides will suffer. At this point the writer, believing in a practical approach, feels that a screen must return the maximum possible amount of light to the greatest number of desirable seats in any auditorium. It must also distribute light evenly enough to avoid "hot spots" and too rapid fall-off within useful viewing angles. The word "useful" should be analyzed with care in this instance.

A theatre traditionally fills up in the shape of a modified diamond. The most desirable seats are occupied first in the center diamond. Then overflow takes place at the rear, next at the center and rear sides, and lastly, the extreme front of the theatre, especially the front sides. The exhibitor is well qualified to judge the results and knows the useful angles that are his special problem.

It might be well to quote here from a report that was prepared by a technical and scientific organization within our industry, the Motion Picture Research Council, whose reputation for accuracy cannot be questioned:

"We can see that to bring brightness levels up to the values now obtained in accepted practice, it is necessary to increase the brightness of wide screens or of screens used for 3-D, either by increasing the total light reaching the screen from the projector or by increasing the brightness of the screen for a given illumination, or both.

Increasing Brightness

"As has been indicated, two general methods are available for increasing screen brightness. One is to increase the light from the source. The other way is to increase the *brightness gain* of the screen. This can be done by increasing the reflectivity of the surface or by changing the reflection characteristics so that more light is reflected in those directions where it will be useful."

Either of the above methods can be used with success, in the opinion of the writer. The question of uniformity of surface enters the picture and becomes the manufacturer's problem.

As for polarization defect, the Polaroid Corp. would like to see screens with a polarization defect of only 0.5 or one half of one percent. This is attained by certain screens at direct viewing angles, but varies considerably at 45-degree viewing angles. At this extreme, defects as low as 1 percent and as high as 6.5 percent have been noted. In the author's opinion, at wide viewing angles the defect should not exceed approximately 2 percent for best results. Since 3-D is still with us and promises to be an important feature for some time to come, the exhibitor should ponder well the over-all performance of any contemplated new screen.

BRIGHTNESS INCREASE REQUIRED TO MAINTAIN PRESENT STANDARDS*

Screen aspect Ratio	With Anamorphotic Lens		With reduced Aperture Height	
	2D	3D	2D	3D
1.33 to 1	1.	3.33	1.	3.33
1.66 to 1	1.25	4.17	1.56	5.20
1.75 to 1	1.31	4.36	1.72	5.75
1.85 to 1	1.39	4.63	1.92	6.40
2.00 to 1	1.49	4.97	2.27	7.55
2.66 to 1	2.00	6.67	..	..

Present Standards mean Screen Brightness at center of 9 to 14 Ft. Lamb.
Present Standards mean incident light at center of 12 to 19 Ft. Cand.

* Table prepared by the Motion Picture Research Council

What's Your Problem?

Projectionists whose problems appear below will each receive a $5.00 check from IP. We'd like to know "what's YOUR problem?"

Q. *Will you please help another "goat" — namely, a projectionist. I am supposed to be at fault over some damaged film. The exchange claims I damaged it by faulty threading of the projector. I believe the damage was due to defective perforation. I am enclosing a sample of the film. 1400 feet was damaged from the Paramount feature "Roman Holiday" which I ran as a new print. Being unable to convince the exchange, I am taking the privilege of asking your expert opinion and advice.* JACK BAYLOR, *Mt. Baker Theatre, Local 117, Bellingham, Washington.*

A. The damage on the film sample sent to us, tiny nicks in the pulldown edges of the sprocket holes on both sides of the film, could have happened in a variety of ways and in a variety of places, even in the processing laboratory itself. Sometimes these prints leave the lab and go in and out of the exchange and somehow miss inspection all along the line. However, you seem to be quite sure that the damage was not caused by faulty threading. This narrows things down to two possibilities, a faulty print from the lab and damage due to newness of the print and occurring in your projector. An "unseasoned" print when first exposed to the heat at the film gate can suffer a softened emulsion. This may work off at various spots in the projector mechanism and, being gummy, increase tension just enough to cause the nicks as shown on your film. This sticky emulsion may, after awhile, work its way out, or be worn off, and then we'll defy anybody to tell what caused the trouble. The projectionist can examine his loops while the machine is running, check his tension — and then wonder how in heck the nicks got on his film. The people in the exchange don't wonder at all, they just blame the projectionist. Incidentally, your letter gave IP the idea that it was about time we ran another piece on film damage. It's in this issue.

* * *

Q. *It seems to me that it is about time that something be done about "black prints." I mean those "tar paper" black-and-white prints you can't pump light through. Thirty years ago, 35 amps produced a well-lighted picture. Then prints came along that were darker and we boosted the amps. Then the prints got darker. The lamp manufacturers turned out better lamps. Again the prints got darker, and once more better lamps came along. National Carbon Co. came out with better carbons. So the prints got darker. Like Major Bowes once said, "Round and round it goes. And where it stops, nobody knows." To this writer, it seems that it is about time this thing were stopped. I would suggest that members of projectionists' groups, the producers, and the film labs get together and talk this thing over. The writer works in a drive-in. Picture is 58 feet wide; throw, 260 feet; angle, ten degrees up; picture area, 2525 square feet. Aluminum-painted screen does not help any. The drive-in operator is really behind the eightball. I believe the above situation is worth looking into.* H. Y. BALLOU, *Manhattan Beach, Calif., Local 150.*

A. With an outdoor screen as large as yours it is no wonder that prints seem to be made of tar paper. So far as conditions 35 years ago are concerned, the drive-in business was unknown. Theatre screens were smaller and not nearly so well lighted as they are today. Since that time organizations such as the SMPTE and the Motion Picture Research Council have established standards both for print density and screen light that are aimed at giving the sharpest and most pleasing picture possible in indoor theatres. Unfortunately, similar standards have not as yet been set for drive-ins.

It is true, of course, that a somewhat brighter picture can be obtained on a drive-in screen if a lighter-density print is used. We hear that it is a common practice to supply such prints in areas where there is a heavy proportion of drive-ins, and the print is known to be specifically for them. Light gained in this manner, however, is gained with a loss of sharpness and contrast. It is a question of which is the lesser of two evils.

CinemaScope in Britain

Only 13.5% of theatres in Great Britain could switch to CinemaScope and maintain that system's aspect ratio of 2.55 to 1 without structural alterations, according to a survey by the British Kinematograph Society. It was pointed out, however, that 80% of the theatres could show CinemaScope if the height of the picture were reduced about 27% to preserve the width to height ratio.

Ampex Has New Stereophonic Sound Series

A new stereophonic theatre sound system designed to "make show failure almost impossible" has been developed by the Ampex Corp., Redwood City, Calif. The system, known as the Master Series, is priced at $3,995 for the complete package. Distribution is through the Circuit Construction Corp., and all installations are handled by the Altec Service Corp.

Some 100 Ampex sound installations are now in theatres throughout the country, according to Harrison Johnston, Ampex sales manager. These are in the 30, 60, 80 or 100 watt classifications. The new Master Series, in the 30 watt class, follows the higher priced De Luxe series and Super series.

Primarily a three-channel system, the Master series may be changed to four channels by using the theatre's existing optical system, it was stated by Ross Snyder, Ampex engineer.

The new 30 watt series equipment includes two penthouse magnetic reproducers, each equipped with four channels in the head, three for sound and one for the signal, together with a simple switching system adaptable for either three or four channel operation. Power amplifiers, pre-amplifiers and three stage speaker groups are included in the Ampex package.

The safety feature, Snyder said, is a switch in the projection room whereby the projectionists can correct any speaker failure quickly by funnelling the sound from any one channel into the two remaining speakers. Should two speakers fail, the one remaining speaker could handle the whole show.

Failure of any pre-amplifier or power amplifier will not cause a show stop, according to Ampex engineers, since the same type of emergency switch enables the projectionist to use the equipment remaining in operation.

Harrison Johnston said that 45 Ampex installations were made in the New York area for showing "The Robe" during the holiday season. Ampex equipment, Johnston said, was installed at the Egyptian Theatre in Hollywood for the world premiere of MGM's first CinemaScope picture, "Knights of the Round Table."

Pension Protection — Goal of Labor

Various cost factors that must be worked out when setting up an adequate pension plan — now much discussed among IA men — are considered in the following article which reflects the official views of the AFL.

V

COST is probably the most difficult single question involved in the establishment of a pension plan. Only a reliable actuary is qualified to make a firm estimate as to how much a given level of benefits for a particular group of workers may cost—or how much in the way of benefits a given level of contributions can safely provide — and even his estimate is likely to be little more than an educated safe guess.

While the union negotiator should not undertake the functions of an actuary, he should know something about the principles upon which cost estimates are based, so as to be able to make intelligent use of these figures at the bargaining table, and in the administration of the plan.

The actual operating costs of a retirement plan will be determined by: (1) the amount of benefits paid to each retiring worker; (2) how many workers qualify for benefits; (3) how long retired workers live to receive benefits; (4) the rate of interest earned through the investment of the money held in the pension fund; (5) the expenses incurred in administering the pension system (clerical expenses, legal, actuarial and accountant's charges, etc.).

Actual Pension Cost

The real cost is equal to the total benefits paid out, less the interest earned, plus the operating expenses. How much a plan will be costing at any one future *moment* in time cannot be accurately predicted long in advance. However, over an extended period of time, the temporary up and down movements of these variable factors will tend to balance out.

To aid in making this estimate, the actuary has certain facts, records, and tables of statistics available. These records and tables show what past experience with the factors affecting pension costs has been.

If a group of workers is large enough to enable the "law of averages" to work out as expected; if the group has no peculiar characteristics which might cause a variation from the general experience on which the assumptions were based; then the actual cost should — over the long run — turn out to be reasonably close to the actuary's preliminary estimate.

There are other causes which may lead to substantial deviations between estimated costs and actual costs. A system whereby cost estimates are based on certain past averages cannot anticipate long-term upward or downward trends which may cause these averages to be no longer valid in the future. There is no practical way for instance in which actuaries can take accurate account, in advance, of extraordinary events such as wars and depressions.

Generally speaking there are two ways in which unions and employers can get outside actuarial assistance in setting up a pension plan. They can either engage a professional consultant on a fee basis or they can call in an insurance company representative and ask him to submit cost estimates for a proposed plan.

An insurance company will supply cost estimates "free" of any direct charge to the union or employer, in hopes of selling its particular insurance product to the parties. However, all of the insurance company's expenses, including sales commissions, and profits, are included in its premium charges — so none of its services are actually "free" of charge.

(Continued on page 33)

Versatile Magnarc Lamp Used for CinemaScope

The versatile Peerless Magnarc reflector arc lamp, standard equipment in a variety of projection rooms since it was first marketed in the thirties, has been adopted for many CinemaScope and 3-D installations during the past few months according to the manufacturer, the J. E. McAuley Mfg. Co., Chicago.

Peerless Magnarc 40- to 75-amp lamp.

The Magnarc, which can be operated on a wide range of current loads from the so-called one-kilowatt trim using 40 amperes with 7-mm positive and 6-mm negative carbons to a 75-ampere trim using 9-mm positive and 8-mm negative carbons, is easily adjusted to meet different light requirements. If, after installation, it is found desirable to change the original carbon sizes to use more or less current, this may be accomplished with very little effort in the projection room by simple alterations in the gear arrangement of the positive carbon feed.

One of the latest improvements in the Peerless Magnarc is the carbon-trim alarm, regularly furnished as standard equipment on the deluxe models, which provides two signal lights mounted at the rear of the lamp to warn the projectionist if insufficient carbon remains for the showing of another reel when the arc current is cut after a changeover.

An important feature of the Magnarc is the method employed to insure correct alignment of the positive and negative carbons which consists in providing "floating" carbon clamps and rigid carbon guides near the arcing end of each carbon. The function of the carbon-end guides is to accurately locate the ends of the carbons in respect to each other. Since the positive and negative carbon clamps "float" in their respective supports, even badly warped or crooked carbons can be made to burn perfectly.

An adjustably-mounted arc-stabilizing magnet makes possible a means for the complete arc stabilization and control, and impressing of the gasses of the core of positive carbons, thereby materially increasing the percentage ratio of lumens per arc watt of the total light generated by the arc, at no increase in current or carbon costs.

The magnet is made of alnico and is a double-bevel end, bar type. It is adjustably positioned well above the axis of the carbons, so that the entire magnetic flux force is exerted against the arc crater and its gasses with an impressing effect.

Magnarc installations include not only indoor theatres but a large number of small and medium-sized drive-ins, particularly in the south.

IN THE

SPOTLIGHT

TELEVISION, for all its highly exaggerated threat to the motion picture industry is of vital interest to projectionists for a variety of reasons, not all of them on the debit side of the ledger. For example, it is estimated that from 1,500 to 3,000 projectionists are employed in television studios in the United States and Canada. Two factors are expected to double even that top figure within the next couple of years — the increasing number of new Tv stations and the rapidly increasing use of film.

Latest figures from the Federal Communications Commission show that an average of about 3 dozen new Tv stations start operations each month. Each station employs from 3 to 12 projectionists, and by striking an average of, say, 6 to a station, we find that more than 200 new jobs for projectionists are opened up each month.

John J. Francavilla, IA representative, is authority for the information that well over 5,000 members of the Alliance are now employed directly in Tv studios. The figure includes stagehands, projectionists, wardrobe people, and other IA classifications. The projectionist performs a variety of tasks, such as the showing of movies, handling of rear projection for "live" shows, the projection of slides and film commercials, and, in some studios, "riding the boom."

• Two-year contracts recently negotiated between Pittsburgh Local 171 and the Theatre Managers Association, which represents the Stanley-Warner, Loew's, Shea and Harris circuit theatres in the Pittsburgh area, provide for a 15-cent hourly wage boost for the Local membership, retroactive to October 31, 1953, with an additional 7½ cents per hour becoming effective the second year of the contract.

An important feature of the new pact is the elimination of *free* preparatory time which usually averages from 30 minutes for a new show and 15 minutes other days. Pay for this time, also retroactive to October 31 last, adds another 2½ to 3½ percent to the overall hike in pay.

• Harold Lackey, business representative for Local 337, Utica, N. Y., has been named to the arrangements committee for the forthcoming Union Label Industrial Exhibition to be held at Utica's Hotel Hamilton, May 20-22. This exhibition will be held in conjunction with the sessions of the Union Label Trades Department of New York, and it will be modeled after the shows which are sponsored in the larger cities by the AFL's Union Label Trades Dept. It is expected that a large number of New York State AFL affiliates will be represented.

• The annual installation dinner and dance of the 25-30 Club was a lively affair with little time devoted to speeches and the greater part of the evening reserved for merrymaking. A highlight of the affair, which was held last month at Zimmerman's Hungaria in New York, was the presentation of a life-size portrait of the late Mike Berkowitz, a former president of the Club, to his widow.

Among the invited guests attending the party were Arthur E. Meyer and Barry Passman of International Projector Corp.; Allen Smith, National Theatre Supply; Paul Reis, National Carbon, and Bernard Scholtz, of RCA. Souvenirs ranging from pocket memo books from IPC, to pocket flash lights from NCC, and pocket diaries from RCA were distributed to all the guests.

Out-of-town Locals were represented by a delegation from Local 384, Hudson Co., N. J., which included Al DeTitta, Ralph DeMea, John Contoli, Tom Nethery, Tony Boscorelli, and past Club presidents Al Kaye and Ed Dougherty. From Local 640, Nassau County, N. Y., came Joe Engel. Westchester Co. Local 650, N. Y., was represented by Fred Thome. Among the Local 306 members present were Ernie Lang, Isidore Schwartz, Harry Garfman, Charles Eichhorn, Mike Springer, Eddie Stewart, Charles Muller, and Wally Burns. Judge Nat Doragoff, member of Local 306 and chairman of the N. Y. State Workmens Compensation Commission, was also present, as were IP's Fred Hodgson and James Morris.

The 25-30 Club officers for 1954 are Abe Kessler, president Jacob S. Winick, vice-president; Morris I. Klapholz, secretary; Benjamin Stern,

Oscar Rosenbaum, member of New York Local 306, whose hobby is painting, proudly stands next to the portrait he painted of the late Mike Berkowitz which the 25-30 Club presented to the widow at the group's annual dinner.

Morris J. Rotker (center), past president of the 25-30 Club, installing the newly elected officers. Shown above, left to right: Anthony Boscorelli (L. 384, Hudson Co., N. J.), trustee; Jacob S. Winick (L. 306, NYC), vice president; Abraham Kessler (L. 306), president; Rotker; Abe Seligman (L. 306), sergeant-at-arms; Abraham Stern (L. 306), financial secretary, and Morris I. Klapholz, (L. 306), recording secretary.

financial-secretary; Abe Seligman, sergeant-at-arms, and Julius Wetzler, trustee.

• The long drawn out negotiations between Local 348, Vancouver, Canada, and the Famous Players theatres in the Local's jurisdiction, seem to have reached a stalemate. The Local rejected the latest award of the conciliation board and Orin M. Jacobson, International representative, has been appointed to investigate the case.

• At the January meeting of Detroit Local 199, the membership unanimously elected President Frank Kinsora to the office of business representative, to succeed ailing Roger

Frank Kinsora, business representative, Detroit Local 199

Kennedy whose illness forced him to resign from office. Deeply appreciative of the loyalty of the members, Kinsora requested this department to publicly extend his thanks to them for their confidence in his ability to cope with the many problems confronting the local. He has been a member of 199 for the past 42 years and has held various offices. He is a native of Detroit, a veteran of World War I, and is the father of three sons, all of whom are veterans of World War II.

• IA President Richard F. Walsh has been named chairman of the labor committee for the film industry's 1954 Brotherhood Week campaign.

• A catastrophe was averted last month when 1,600 patrons watching a movie at the Granat Theatre in Mexico City were hurried out of the burning building just before the roof collapsed. It is reported that 10 persons suffered minor injuries. The spectacular blaze, which was caused by an explosion in the projection room of the theatre, reduced the building to a shambles within one hour.

• A gold life membership card in Local 205, Austin, Texas, was awarded to the well-known exhibitor, Louis Novy, head of Trans-Texas Theatres, in recognition of his friendly relations with the Local extending over a period of many years. The presentation was made by Local officials Frank Sykes, Jr., president, and C. W. Schubert, business representative.

• Lawrence J. Katz, IA representative, assisted Local 561, Johnstown, Penna. officials in negotiating a new three-year contract with the Stanley Warner and Fabian Theatres. Details of the agreement have not been announced but it is said to allow for substantial wage increases.

• We enjoyed a very pleasant visit with Douglas Cameron, member of Toronto Local 173, who spent several days in New York last month on a business trip.

• Morris J. Rotker, member of New York Local 306 and former president of the 25-30 Club, was re-appointed to the Local School Board, District No. 19, Bronx, N. Y., for a five-year term. The appointment was followed by his election to the office of secretary of the Board.

• Prentiss E. Flowers, charter member of Local 400, Alexandria, La., has returned to work after an illness of nine months, four of which were spent in a local hospital.

• According to a survey made by the *New York Times*, craft workers in the West Coast motion picture studios lost at least 900 days of work during the year 1953 because of films made abroad by American producers. The survey further reports that at least 1,000 craft workers, not including performers in the bit roles and extras, were affected.

In a recent trade announcement, IA President Walsh stated that the IA did not object to pictures made in foreign countries where frozen American funds were involved or when it was necessary to obtain authentic foreign locales, but he did voice strenuous objections to those producers who went abroad for the express purpose of obtaining cheap labor. He referred particularly to those producers who made film commercials abroad to be used in this country to "sell American products to the American people."

Paramount producer George Pal (left) hosts James W. Hickey, business representative, Local 159, Portland, Ore., and Mrs. Hickey on the set of "Conquest of Space." In addition to his duties as an officer of the Local, Hickey works as a projectionist at the Oriental Theatre in Portland. Behind Mrs. Hickey is seen Eric Fleming of the picture's cast.

• The recent re-election of Charles F. Wheeler as secretary-treasurer of Local 108, Geneva, N. Y., marks his 22nd year as an official of the Local. His side-kick, E. Francis Larham, is serving his 8th consecutive term as business representative.

• Copies of the 96-page booklet, "American Labor Looks at the World" (Volume VII), is now available at 50 cents each from the Free Trade Union Committee, AFL, Box 65, Radio City Station, New York 19, N. Y.

Herman Gelber, president of New York Local 306, being congratulated by IA President Walsh upon his installation into office last month. Participating in the ceremonies may be seen the following Local 306 officers, left to right: Steve D'Inzillo, N. Y. business representative; Frank J. Inciardi, executive board; Archie Hollander (his head may be seen peeping out behind Inciardi's shoulder), retirement board; Al Kunze, vice-president; Max Kessler, executive board; Charles F. Eichhorn, retirement board; Walsh; Herman Boritz and Frank E. Miller, executive board; Gelber; Max Aidikoff, sick committee; David Shapiro, retirement board; Artie Klein, sick committee; Ernie Lang (seated), recording-secretary; Herman Stoller, sergeant-at-arms; Harry Garfman, Brooklyn business representative; Al Ashkinas, executive board, and Phil Shafran.

The simple combination of a hook and counterweight, mounted as shown in the two illustrations above, can make life much easier and safer for projectionists. Note the ease with which the heavy reel is lifted to the eye-height spindle of the projector.

3-D Is Job For Men of Muscle

So a safety-conscious insurance company executive comes up with a system of pulleys and hoists to make life healthier and happier for projectionists

By ROBERT L. MOORE

DID YOU EVER haul an old-fashioned "lightweight" reel up the rungs of an iron ladder from the rear of the back balcony into the projection room aerie of a motion picture theatre? Remember away back in the dim and distant past (last year!) how much those things weighed?

You can't do that with the new babies, the 3-D and Cinerama monsters of 1954 — not without leaving yourself open to an uncomfortable hernia and an aching back.

Unless you rig up a very simple system of a pulley, a wire and a counterweight.

Reel Hazard

However, and this is important, despite the pulleys and the counterweights, hand-handling of the new king-sized reels is still essential. So the next time the boss asks you to lug a mile and a half of film from here to there (an 8,000-foot reel contains just about 1½ miles of film) play it safe and protect your health.

Make no mistake about it, the new and heavier film reels for the new techniques represent a real hazard for both projectionists and shipping personnel. For projectionists there is a double hazard. The film has to be brought from the lobby to the projection room (and sometimes projectionists do that job) and it has to be mounted on the projector as well.

Safety Tricks

Cinerama reels, for example, may reach three feet in diameter, weigh as much as 60 pounds and hold 8,000 feet of film. Although CinemaScope reels are on the lighter side, they, too, should be handled with care.

The usual shipping procedure is to put two separate reels in one can so, even for ordinary 5,000-foot reels, these reels may reach a weight of from 90 to 100 pounds. What then is the 3-D, CinemaScope and Cinerama picture? It's black and blue, with sound effects, if you drop a reel on your toes!

Below are some of the tricks worked out for safety's sake in the handling of the block-buster reels:

Get the manager to obtain a spare 3-D film can, parked permanently in some storage space on the lobby floor of the theatre where it is handy when the delivery truck comes around.

When the usher, the porter, or whoever else does that job, receives the can of film in the lobby, he takes out one reel. This is placed in an ordinary newspaper boy's canvas sack, or some similar bag, and the one reel and the spare can be carried to the projection room (using a hoist if you have the old iron ladder business).

Tripping Hazard

In the projection room the reel is immediately taken from the bag and placed in the can. Then the porter (or whoever) return to the lobby for the second reel. This is carried in the bag to the projection room and placed in the can with the first reel.

Never, but never, allow a reel to lie on the floor or stand vertically. There's a tripping hazard and, in addition to breaking a leg, the film might be injured.

A good idea, too, is to have a special cart (see illustration) for moving the film cans up stairways. The best type consists of two sets of three rubber tires which allow a direct pull as the handler precedes the cart up the stairs.

Nylon Strap

Another method, also illustrated, involves a nylon carrying strap. The strap fits over the shoulder and the carrier uses his hand to carry part of

The strain of lugging heavy reels up theatre stairs is eliminated by means of this specially designed cart. It has two sets of three rubber - tired wheels.

° Mr. Moore is director of the Technical and Engineering Division, Safety Engineering Department, Lumbermans Mutual Casualty Co., of Chicago, Ill.

An adjustable nylon carrying strap makes the job of carrying a film can much easier. For safety's sake, grasp the hand rail. Also help distribute the weight by using the handle. A 3-D can loaded with two reels is definitely a two-man job.

the load by its top handle. While the combination of strap and handle helps to distribute the load over the body, this is still an unwieldy way of lugging film cans around. Incidentally, the strap is attached by simply opening the can and running the nylon strap under the lid, remembering to close the lid securely over the strap. The strap may be equipped with an adjustable buckle so that it may be carried by men of assorted sizes.

The container, or carrying can, is equipped with two side handles and a two-man operation should be insisted on wherever and whenever possible. Then the total weight can be halved and properly distributed. This should, without question, be a two-man operation whenever two reels are carried at one time.

Sash Weight Hoist

Once the can is in the projection room, the problem is a bit simpler than getting it up the stairs. Reels must be lifted by the projectionist to approximately eye-height to place them on the spindle of the projector. Because of the awkward lifting job involved this constitutes a very definite hernia hazard if not handled properly.

For the lifting job a counterweight arrangement, as illustrated, with a hook of some simple design is suggested. The hook for the job holds the reel in place by a spring. This engages one side of the reel so that it may be easily unhooked after the reel is mounted on the spindle. A sash weight only slightly lighter than the full reel will provide the counterweight. Obviously, the projectionist is only called upon to lift the difference between the full reel and the weight.

Big reels, and perhaps even bigger reels, seem to be very much the style for today and for the future. Handling them shouldn't be too difficult a task for the projectionist who knows the score. And just think of the advantages over the small reel, what with half the number of changeovers and thus exactly half the chances for trouble!

Like it or not, big reels are here!

A newsboy's canvas bag is just the ticket for lugging 3-D reels around—one reel at a time. Try carrying two and you're just begging for something to happen. Pictures courtesy of National Safety News Magazine.

Film Industry Profits Rise Despite Forebodings

Despite the dire predictions of bankruptcy prevalent last summer, it would seem that most theatre circuits and producing companies earned increased profits during 1953 and were faring better than industry in general. This was indicated by a check of motion picture securities with the general average of 50 leading stocks as compiled by the *New York Times* and by reports from other sources.

Reports from leading theatre circuits on gross profits during the closing months of 1953 indicated scarcely any instance where box office revenues were not reported at least slightly in excess of 1952. In some cases the reports indicated business as 10 percent and more over 1952.

Credit for the increase has been given both to the availability of pictures with more powerful boxoffice pull, and to a new interest in motion pictures on the part of the public created by the introduction of the new processes, CinemaScope and 3-D. Another factor mentioned was that Tv set purchases have reached something close to a saturation point in most heavy-population areas. It is also said that people are getting back into the habit of going out when superior entertainment is available.

Ten common stock issues, Allied Artists, Columbia, Loew's, National Theatres, Paramount, Republic, RKO Pictures, RKO Theatres, 20th Century-Fox and Universal, showed a gain of 23 7/8 points or an average gain of 2.38 points. This contrasts with an average loss during 1953 of 18.48 points in the *New York Times* average of 50 leading stocks issued by a variety of industries.

Theatre circuits which registered gains during 1953 include National Theatres, which paid 30 cents a share on its common stock, valued at 6⅞ dollars a share at year's end, a gain of 2 7/8 dollars or points over 1952. RKO Theatres paid 15 cents a share in 1953 on common stock valued at 4¼ dollars a share at year's end, 1¼ points over its value at the end of 1952. Loew's, Inc., paid 80 cents a share on its common stock which stood at $13 a share at year's end, ¼ of a point more than at the end of 1952.

In the motion picture production field, business also improved in 1953, according to profit reports. Considerable gains were registered by Columbia and 20th Century-Fox, with Warner Brothers remaining in approximately the same profit position.

Columbia Pictures common stock, valued at 20¾ dollars a share at year's end, was 8¼ points higher than last year. 20th Century-Fox stock rose to 20½ dollars at the end of the year, gaining 7⅛ points and paying $1 per share for the year.

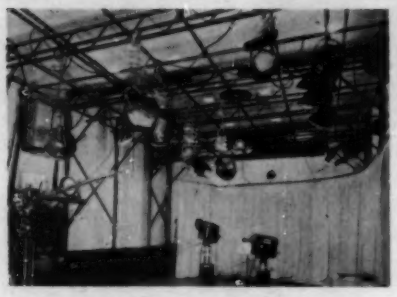
Allied Artists common stock was selling for 5½ dollars a share at year's end, 2⅝ dollars more than at the end of 1952. Universal paid yearly dividends of $1 per share, and its common stock rose 4⅞ dollars in value during 1953 to 19¼ dollars at the end of the year.

However, some production companies did show losses. Paramount stock was down 1⅝ dollars a share for the year, RKO Pictures 1⅛, and Republic ⅝. Early this month RKO stock doubled in value in one day on Howard Hughes' statement that he was throwing an additional $23,000,000 into the company in a move to gain absolute control.

According to Dept. of Commerce figures, there were 3,400 more theatres in the United States on June 30, 1953, than on December 31, 1944.

New Products for the Industry

UNISTRUT METAL FRAMING. An easily and quickly assembled system of metal tube framing for overhead projection and production lighting in television studios



This is the Unistrut movable grid system of metal framing, designed to handle lights, microphones, wiring for projection equipment, etc., in television studios where space is at a premium. This is the installation at Station KGO-TV in San Francisco, Calif.

is being marketed by Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, Ill. The prefabricated, completely adjustable scaffolding easily supports the 1½" nominal black pipe sections that support the actual lighting units. Portable patch plug sets are attached directly to the Unistrut.

GALLAGHER 16-MM ARC PROJECTOR. Using the Strong Junior High Intensity arc lamp and rectifier along with a specially built RCA arc head projector assembly, this new piece of 16-mm equipment operates from any AC outlet. Manufactured by Gallagher Films Inc., the projector is available through all RCA dealers.

MULTIPLE ASPECT RATIO LENS. Tests will be made shortly at the Paramount Theatre, New York, of a new set of lenses designed to enable projectionists to switch from the CinemaScope ratio of 2.55 to 1 to smaller ratios at various times during the showing of a picture. IP will carry a report on the system in a subsequent issue

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"SLICE-AWAY" TRANSISTOR BATTERIES. Tiny high-power batteries for use with transistors are announced by RCA. The new batteries can be sliced like a roll of salami into numerous combinations of cells to provide different voltage requirements. Two types are now on the market (VS087 up to 2 ma and VS088 up to 10 ma). Both are 21-volt special purpose types, intended mainly for experimental use. Each contains 15 individual ¼-volt crown-type alkaline dry cells encased in a plastic sleeve. Various power requirements from ¼ volts to 21 volts may be obtained quickly by simply slicing the battery with a knife.

ALUMINUM DRIVE-IN PAINT. Tropical Paint and Oil Co., Cleveland, Ohio, is marketing a new aluminum paint for drive-in screens which the company claims "combines general screen brightness and low light deflection with durability and weather resistance in outdoor use." The paint has been tested by the Polaroid Corporation and, according to the Tropical Co., was rated "high in brightness and clarity of angle viewing."

FIRST COLOR TV RECEIVER. Emerson Radio and Phonograph Corp. is the first manufacturer to announce for sale a color TV receiver. The price tag is $700 for the Model C-500, a console ensemble with a 16-inch tube providing a 14-inch picture.

METRO OPTICAL STEREO SOUND. Arthur M. Loew, president of Loew's International, announces a new stereophonic sound device that records sound-on-film by optical means instead of magnetic striping. The new device, says Loew, requires no changes in the present standard optical head. A device to achieve the same purpose, in which darkened intersprocket spaces on the film are used to cue sound signals, was reported in IP for October as a product of Dorsett Laboratories, Norman, Okla.

COLOR TV TESTER. Designed to measure the performance, alignment and phase errors of color television, a new testing instrument, the 1601-AR, has been introduced by Telechrome, Inc., Amityville, L. I. A calibrated chart on the cathode tube face permits the setting of standard color values and also indicated phase and burst amplitude.

GLARE SPRAY. A glare-softening Aerosol spray is offered to television and motion picture cameramen by the Crescent Portrait and Frame Co., Cleveland, Ohio. The spray gives a matte surface to shiny objects, thus eliminating bright reflections under studio lights.

CINEMASCOPE DRIVE-IN SCREEN. Claimed by the maker, Poblocki & Sons, Milwaukee, Wis., to be suitable for CinemaScope and 3-D in drive-ins, a new corrugated aluminum screen is now on the market. The screen is reported to cost from $12,000 to $20,000.

Standards? We'd All Go Crazy Without Them

Maybe the fellow in the cartoon at the right has got hold of a lens with too short a focal length—but, whatever the cause of his troubles, the cartoon is supposed to illustrate the importance of standards in motion picture projection. The cartoon, taken from a lively little booklet, "Through History With Standards," published by the American Standards Assn., shows what might happen if chaos were to return to the projection room. That is, chaos old style. In the old days (and many a projectionist remembers them with shudders) sprocket holes and film perforations were all sorts and sizes. Film was ribbed, torn, mangled and generally abused. Then, in 1916, the Society of Motion Picture Engineers, now the SMPTE (television has been added), got to work. Standards were set and, with the cooperation of the ASA Sectional Committee on Standards for Motion Pictures, these were quickly adopted internationally. Today, more than 60 American Standards prevail in the industry, most of them world-wide in effect. Now motion picture film from one country can be projected on the equipment of any other country in the world whether the machines be American or foreign.

IA ELECTIONS

LOCAL 108, GENEVA, N. Y.

Arthur J. O'Neill, *pres.*; Emerson Garling, *vice-pres.*; Charles F. Wheeler, *sec.-treas.*; E. Francis Larham, *bus. rep.*; William Baroody, Arthur Gardner, *trustees*, and E. F. Larham, *del. to State and IA Conventions.*

LOCAL 171, PITTSBURGH, PENNA.

Daniel V. Flask, Sr., *pres.*; Harold O'Donnell, *vice-pres.*; James V. Sipe, *bus. rep.*; Luther W. Thompson, *sec.-treas.*; Dean Martin, Leroy McConnell, and Charles Lang, *exec. board*; James O. Caskey, Russell R. Kerr, Michael J. Ventrone, *trustees*; Angelo Diodati, *sgt.-at-arms*; D. Flask, Sr., Henry W. Link, Sr., Paul P. Mach, and J. V. Sipe, *del to IA onvention.*

LOCAL 204, LITTLE ROCK, ARK.

Leonard Thalmueller, *pres.*; Jimmy Cowsert, *vice-pres.*; Paynter Rochelle, *rec.-cor.-treas.*; L. B. Herring, *fin. sec.*; Guy Redmond, *treas.*; J. H. Schoemaker, *bus. rep.*; Walter Melton, *sgt.-at-arms* and *trustee*; J. Sipe, *del. to IA Convention.*

LOCAL 257, OTTAWA, ONT., CANADA

James P. McGuire, *pres.*; John Macauley, *vice-pres.*; Wm. H. Hartnett, *bus. rep.*; W. Murray Hall, *sec.-treas.*; S. Ventura, *sgt.-at-arms*; E. Field, L. Lamothe, and D. M. Ritchie, *trustees.*

LOCAL 303, HAMILTON, ONT., CANADA

Harry H. Thornberry, *pres.*; Stanley L. James, *vice-pres.*; Hugh W. Usher, *bus. rep.*; John P. Owens, *treas.*; Hugh J. Sedgwick, Herb Konkle, and James C. Rowe, *exec. board.*

LOCAL 343, OMAHA, NEBR.

Alvin Kostlan, *pres.*; Ora Farnsworth, *1st vice-pres.*; C. Jones, *2nd vice-pres.*; Ross Hatton, *treas.*; J. I. Kelly, *fin. sec.*; Clyde Cooley, *sec.*; Howard Jackson, *bus. rep.*; Al Frazier, *sgt.-at-arms*; R. L. McIntyre, Clyde Blubaugh, Art Krake, *trustees.*

LOCAL 376, SYRACUSE, N. Y.

Louis R. Boyd, *pres.*; Melvin A. Denny, *vice-pres.*; George F. Raaflaub, *sec.*; Lionel B. Wilcox, *fin. sec.-treas.*; Walter M. Scarfe, *bus. rep.*; John L. Klock; *sgt.-at-arms*; Philip T. Rossomando, *del. Central Body*; Russell Stevens, Charles R. Nelson, John H. Eccles, *trustees*; Lawrence F. Sherman and Warren E. Williams, *exec. board.*

LOCAL 407, SAN ANTONIO, TEXAS

Benno J. Kusenberger, *pres.*; Alfred Pena, *vice-pres.*; Henry Villapadierna, *sec.-treas.*; Horace E. Blanton, *rec. sec.*; W. B. Keeler, *bus. rep.*; Manuel Ayala and G. A. McElyea, *members at large.*

LOCAL 440, ST. JOHN, N. B.

Louis J. McCourt, *pres.*; L. Edward Laird, A. T. Wedge, *vice-pres.*; Cecil Beesley, *rec.-sec.*; James A. Whitebone, *bus. rep.*; R. J. Foulds, *treas.*; A. S. Olive, M. F. Brown, L. A. Chatterton, *trustees.*

Color motion pictures were first exhibited in 1908 at the Society of Arts in London. Two colors were used and the inventor, G. A. Smith, had trouble keeping them in sync.

Free Polaroid Land Camera

- The Picture-a-minute Camera -

for the best letters on

3-D

projection

Have you written Your letter?

If you're a working projectionist, if you know any 3-D tricks, if your ideas can improve stereoscopic projection, then you stand a good chance to win one of these camera beauties as offered by the Polaroid Corp. in cooperation with your magazine

LETTERS from projectionists are beginning to roll into the IP office as men of the craft unburden themselves of their ideas on 3-D projection. The winner of the first Polaroid Land Camera will be announced in the next issue (March) of this magazine.

The contest will run for three months, with the Polaroid Corp. cooperating with IP in a joint effort to find out just what projectionists think about 3-D — and what they're doing about it in their own theatres.

The contest is open to working projectionists only. Letters with your ideas and suggestions will be judged by a three-man panel: Dr. Lewis Chubb, Polaroid research physicist; Henry Kogel, SMPTE staff engineer, and by your editor as the third man. What we want is simply this:

Your suggestions on how to make 3-D better. Any tricks you may have devised in your own projection room, tricks that improve your 3-D projection. For example, one theatre we know has an ordinary carpenter's spirit level handy so that the 3-D filters at the ports may be kept absolutely horizontal. If you've had a brain wave like that, send it in!

If you've found a way to out-smart the exchanges and their sometimes amazing inspection systems, let's hear about it!

In other words, if you, as a working projectionist, have an idea or a suggestion you think is good don't hesitate. Don't walk, run to the nearest mailbox.

You don't have to be a Hemingway. We don't care how the letters are written. It's the subject matter that counts.

Address your letters to the 3-D Editor, *International Projectionist*, 19 West 44th St., New York 36, N. Y.

Write as many letters as you like. And if you don't win the first camera, try again and you may win the second —or the third camera to be offered.

Incidentally, the Polaroid Land Camera is a honey. It's that famous new camera you've been reading about, the one that develops its own pictures in just one minute. The price, if you had to buy it, is a neat $89.75 (and worth every nickel of it!).

The Polaroid Land Camera gives you photography at its quickest, easiest and simplest. One adjustment takes care of all shutter and lens settings. All you do is snap the shutter, pull a paper tab and, voila!, in one minute by the clock you have your picture. Prints are black and white and are big 3¼" by 4¼" — and they can be enlarged or duplicated, too, if you like.

So get you're letters in — fast! To qualify for April's camera your letter must be in the IP office no later than March 15th. All letters shall become the property of IP.

Here's wishing you luck!

Good projection is the key to good 3-D

BOOK REVIEW

THE THEORY OF STEREOSCOPIC TRANSMISSION AND ITS APPLICATION TO THE MOTION PICTURE. By Raymond and Nigel Spottiswoode. 177 *pages and appendices.* With stereoscopic diagrams by Brian Borthwick. *University of California Press.* $6.00.

The Messers Spottiswoode, who should be well known to IP readers for their work in the 3-D field, have taken the mathematical approach to the third dimension in this highly technical exposition of the subject. The writers in the present study look on 3-D as a science, rather than as an art. From the vantage point of this editorial sanctum, wearing bifocals instead of anaglyph spectacles, we are willing to admit that 3-D is complicated but, in its present state at least, we fail to see it either as an art or as a science. Some of the first pictures in the film industry's recent splurge into the medium were apparently produced by people who never got out of fifth grade and we're afraid they'd find this book, with its plethora of equations, rather tough going.

The study is complete, perhaps a bit too complete, except in one department, that of projection. There is some discussion of systems and processes from the point of view of the man behind the projector but one wishes that the Spottiswoodes had given this some additional attention. Curiously, the authors evaluate four systems, the long-awaited Vectograph in which two self-polarized images are carried on one film strip, alternate frame projection, split image projection and the familiar double-band projection of "Bwana Devil," "Hondo" and "Kiss Me Kate." The Spottiswoodes state quite flatly that the Vectograph, because of its simplicity of handling in the projection room, is the best system for commercial projection. However, they also state that the two-film, two-projector system, with all its synchronization difficulties, is the best all-round process when the very tops in 3-D excellence is desired. However, their comment on the double-film is quite interesting. The (double film) system, they write, "has great advantages for production screening in the studio." We know a couple of projectionists who would like to confine it to that limited area, the studio, and keep it out of the theatres.

First 'Scope Theatre

The first theatre to be built especially for CinemaScope, 3-D and the other new projection and sound reproduction methods is planned for a large new suburban shopping center to be built on the site of Roosevelt Field, Long Island, N. Y.

Lens Showmanship

with SUPER SNAPLITE

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...and "Showmanship" includes your plant equipment. Super Snaplite f/1.9 Projection Lenses give *your* patrons maximum viewing satisfaction.

For Better Showmanship and Better Boxoffice use Super Snaplites. True speed of f/1.9 in all focal lengths up to 7 inches.

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KOLLMORGEN Optical CORPORATION

Plant: Northampton, Massachusetts

NEW YORK OFFICE: 30 CHURCH ST., NEW YORK 7, N. Y.

TYPES OF FILM DAMAGE

(Continued from page 10)

damage to the film during projection.

On the subject of extra and unsightly cue marks, exchanges in the New York area were less vocal. Except for prints used a great many times, this did not present a serious problem. The practice of putting confusing and unsightly marks on leaders and using picture-defacing slashes as cue marks at the end of a reel has greatly decreased in recent years, the inspectors agreed.

However, since more than one projectionist has written to this office recently on this problem, it is worth repeating some advice contained in an article by Robert A. Mitchell, "Projection Room Handling of Film Prints," IP for March, 1948.

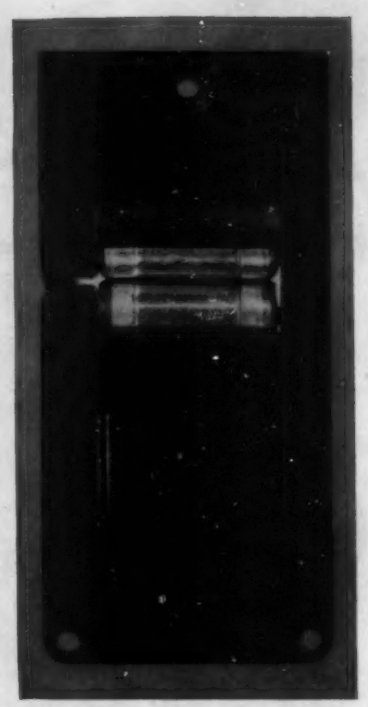
Care of Leaders

"In the matter of conserving leaders, projectionists can help by using great care in threading and by refraining from marking reel numbers, titles, etc., on the leaders with indelible ink," Mr. Mitchell stated. "Notations should be confined to the first few feet of the plain 'protection leader' and then written only with easily-erased cellophane marking crayon or grease pencil.

"The painting of squares and crosses on threading-up footage-number frames has high nuisance value, as has also the cementing of opaque strips of film across leaders.

"Inasmuch as the standard release print depends for its effectiveness on the exact positioning of the cues and leader footage numbers, projection efficiency is reduced when these have been mutilated. It is the responsibility of the distributor to replace leaders which have been unduly shortened through repeated use, and it also behooves him not to overdo the replacement of film to the extent of interposing several yards of black film between footage numbers and the start of the picture. Such excess footage must be removed.

"The motor start and changeover cues are frequently rendered unsightly by projectionists who fear that they may not catch the printed cues when they flash on the screen. Much worse is scratching curtain cues into the emulsion, for their presence is likely to confuse the projectionists who subsequently use the film. Curtain and lighting cues should be marked on the film with crayon, and then wiped off when the film has completed its run.



Magazine valve rollers, shown in the above illustration, can be responsible for much damage to film when dirt, oil or chips of film accumulate around them and may prevent them from turning freely. The results are vertical scratches running up and down the emulsion or the support side of the film.

"Motor start and changeover cues which are really too faint to be seen on the screen may be rendered visible by lightly scoring them with a regular cue-marking device, several of which are on the market. Holes should never be punched in the film."

In conclusion something should be said regarding film damage problems in connection with the new CinemaScope film. Josephine McGrath, chief inspector at the 20th Century-Fox New York exchange, was inclined to feel that exchanges and projectionists still have a lot to learn in processing the new film with its smaller sprocket holes and four magnetic tracks.

CinemaScope Film

Some annoying problems have come up at the exchange, including balkiness of some of the big semi-automatic splicing machines in handling the film which must be scraped on both sides. Also, considerably more care must be exercised in inspecting CinemaScope prints because of the exposed position of the magnetic tracks. (See "Splicing for 3-D and CinemaScope" in the December, 1953, IP.)

The types of damage covered in this article are not meant to comprise an all-inclusive list. Not covered, for instance, is the severe buckling and blistering of film caused by excessive projection temperatures, something that happens most often at drive-in theatres, or the fact that considerable damage is done to film shipped badly wound in deformed or dented cans and reels or by cans being thrown around during transit.

"Common Causes of Film Damage to 35-mm Release Prints," published by Eastman Kodak, covers the subject in detail all the way from the laboratory to the projection room.

Motiograph Offers "Raincoat" In-Car Speaker

With Spring not so far away, and with drive-in operators preparing for what they hope will be banner business, Motiograph is drawing industry attention to its improved "Rainmaster" in-car speakers.

Covering the face of the unit is a taut linen cover impregnated with a chemical which makes it rainproof and dustproof. This, Motiograph claims, makes the speaker impervious to all kind of weather, from cloudbursts to duststorms, and so doubles the life of the unit.

Speaker and box are made of aluminum for extreme lightness. The "Rainmaster" is designed to fit practically any make or model of junction box, so that it may be ordered with or without its junction companion. The junction has multi-tapped transformers which permit exact impedance matching with any make or model of sound reproducing equipment.

The Motiograph Rainmaster

Westrex Has Stereophonic Conversion Unit

PROJECTIONISTS familiar with the Westrex R9 penthouse reproducer for stereophonic sound will be interested in the company's new penthouse stereophonic modification unit for the 1035 single-track magnetic recording system. The unit is illustrated on this page.

The new modification unit adds the facility for the recording and monitoring of three or four magnetic tracks to the basic single magnetic track RA-1467A recorder now used in studios throughout the world.

The new conversion unit is mounted between the recorder and the reel assembly and contains a film driven filter and the magnetic heads. The film is driven by a 32-tooth sprocket and the magnetic recording is quality-regulated by the Davis drive filter. The film also passes over two impedence drums between which are located the two magnetic head assemblies. The unit, Westrex claims, does not interfere in any way with the operation of the regular single-track system.

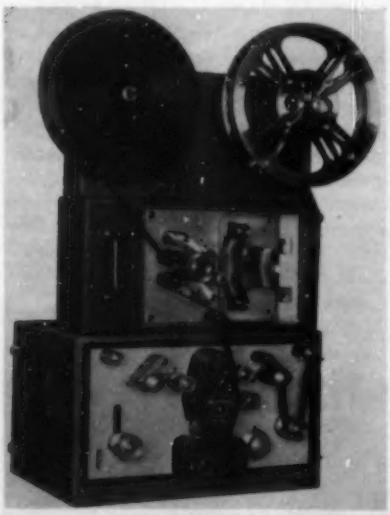
The film pulling mechanism of the conversion unit floats on four rubber mountings to reduce vibration and to permit transportation of the unit without removing the twin flywheels on the impedence drum shafts.

For convenience in threading, the sprocket is provided with detents associated with both pad arms. When either arm is open the sprocket is restrained from moving.

The roller is normally set for the takeup reel to run clockwise but by crossing the takeup belt the roller direction may be reversed. The multiple track magnetic head circuits terminate in receptacles on the rear of the adapter case. The pad arms may be adjusted for film clearance by two screws which secure the base of the of the pad arm assembly.

The impedence drums and the filter rollers have sealed ball bearings containing light oil and, according to Westrex, little attention is required. The idler rollers are made of graphite impregnated nylon.

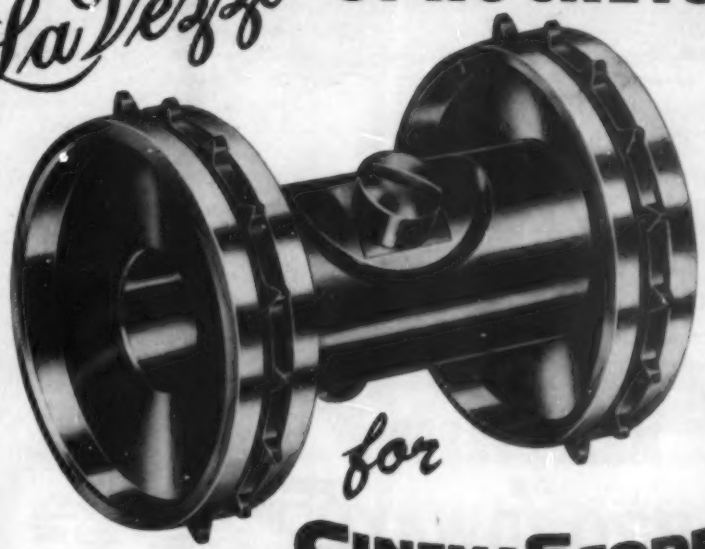
The conversion unit is available for multiple track stereo recording with three tracks in the ASA position, four-track CinemaScope master, or four-track CinemaScope release positions.



This is the Westrex stereophonic modification unit designed for greater facility in monitoring and recording the three or four magnetic tracks to the Westrex single track recorder.

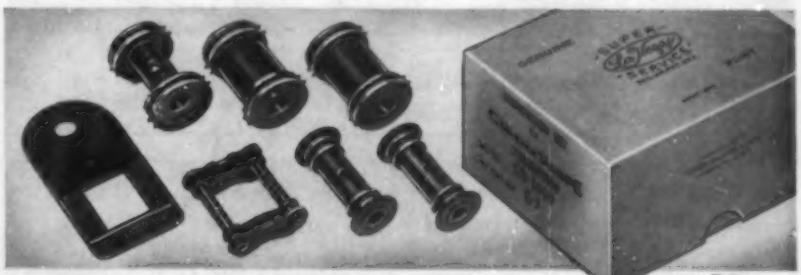
The British navy has developed a 3-D television camera for use at depths down to 1,000 feet beneath the surface.

LaVezzi SPROCKETS



for CINEMASCOPE

The new wide screen presentations demand rock steady projection which for years exhibitors have been expecting and getting by using LaVezzi sprockets. In addition, the clean burr-free teeth are easier on the film—an important factor with the narrow perforations of the four stripe magnetic film. LaVezzi sprockets are properly engineered to resist wear—and are hardened for that extra margin of usable life. For better projection and peace of mind get LaVezzi and be sure!



Conversion kits for most models of Projectors and Sound Reproducers—See your Theatre Equipment Dealer or write direct for illustrated brochure

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Big Future Seen for the New Giant Magazines

Even bigger film reels than the 25-inch giants of today are seen for the future by C J. Williams, sales manager for the Wenzel Projector Co., Chicago.

"The film load of a single reel today," Mr. Williams told IP, "is limited only by the ability of the projector to handle the longer footage magazine, and by the dimensions of the projection room where the bigger machines must be installed."

There has been much discussion in the industry ever since the advent of 3-D and Cinerama over the advisability of the big reel. Arguments pro and con have been heard, with some projectionists preferring the giants because of fewer changeovers. Others complained about the weight and difficulty in handling.

Mr. Williams believes that the changeover advantage is now, and will be in the future, the ruling factor.

"At the start of motion pictures," he said, "reels of 400-feet and 500-feet were considered standard. As the industry grew, the reel grew also. The average became 1,000 feet.

"Then, for the same reason as now, the contents of a single reel jumped to 2,000 feet. The reason, of course, was changeover. The size stopped at that footage because film was highly inflammable and it was considered dangerous to have reels any bigger. Now, with safety film almost universal, a reel can be loaded with 5,000 feet of film, or more, without endangering anyone.

"The first 3-D pictures proved conclusively the ability of projectors to handle 5,500 feet of film on one reel. There seems to be a fast growing opinion that 3-D is in revival and, whether it is run on a single strip of film or on two interlocked projectors, there still remains a strong argument for the 25-inch magazine.

Large Reels Practical

"These big fellows have proved that they are practical in use, that they decrease the possibility of a bad changeover by 50 percent and that they give the projectionist more time to attend to his other ever-increasing duties. Those who say that the big reels are too hard to handle might remember that the same objection was raised when film footage jumped from 1,000 to 2,000 feet.

"With the 25-inch magazines, as they are being made today, with double ball-bearing shafts, suitable gauge cases and covers, and specially designed brackets, hinges and take-ups, together with the comparable price of the 18-inch magazine, plus the fact that any amount of film can be used from 400 feet up to the full capacity of the magazine, it only remains to sum up the magazine situation, as I see it, in this manner:

"The use of 25-inch diameter magazines, where projection room conditions are suitable or can be made so, has a very definite spot in the immediate future of the motion picture industry."

RCA Honors Engineers

Four engineers credited with important contributions to the development of color television were among 20 employees of the Radio Corp. of America who recently received the RCA Award of Merit, the company's top citation for salaried employees. They are: Wallace M. James, engineering manager of the Receiving Tube and Transistor Operations Division; Robert K. Lockhart, design and development engineer at the Camden, N. J., plant; John W. Wentworth, leader of the television terminal design and color projects group in Camden, and Steven Wlasuk, engineering manager for a special projects group at the RCA Service Co.

Snaider Theatre TV on Market

Joseph Snaider, president of the Snaider Television Corp., announces that theatre TV equipment produced by the firm is available to exhibitors on a direct cash-purchase basis in addition to the installment purchase deal arranged by Box Office Television, Inc., promoter of theatre TV shows.

In addition to Snaider portable and RCA permanent equipment, BOTV is said to be willing to finance exhibitor purchases of Trad Theatre TV equipment. Terms call for theatres to pay installation costs, plus one year's rental in advance, and agree to carry all BOTV theatre telecasts that are offered weekday evenings on a straight 50-50 boxoffice split. BOTV, in turn, finances the purchase of the equipment and guarantees a minimum of 30 telecasts a year.

Altec's current installation rate accounts for 75% of total stereophonic sound sales!

Broadway or Main Street, theatre owners know Altec's engineering skill and know-how assure perfect installation, sure service.

That's why Brandt's GLOBE, Broadway, New York, (pop. 8,000,000) and the OPERA HOUSE, Lebanon, New Hampshire, (pop. 4,614) signed Altec stereophonic installation and service contracts!

SPECIALISTS IN MOTION PICTURE SOUND
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ALTEC SERVICE CORPORATION

JACKSON'S Reel-End Alarms
Automatic, not Electric! Projectionists' Favorite! Patented — truly Dependable!
$21.50 per pair
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Test one at your dealer or write to
American Theatre Supply Co., Inc.
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OBITUARIES

EDWARD A. MEILINK, SR., 59, member of Local 228, Toledo, Ohio, died January 24 after a brief illness. For the past 13 years he was employed as projectionist at the Pantheon Theatre. He was a 32nd degree Mason and a member of Damascus Lodge, Fort Meigs Chapter, RAM; Toledo Commandery, Toledo Council, RNSN, and Ancient Accepted Scottish Rite, Valley of Toledo. Survivors are his wife, two daughters and one son.

FRED LEROY SOWASH, 61, president of Local 430, Eureka, Calif., died December 19 after a long illness. He was a member of the Eureka Local for the last 11 years, serving as president the past year. He also served one term as secretary-treasurer and for the past four years as assistant business representative. He worked as projectionist in a number of theatres in Eureka.

An accomplished musician, Sowash took extra training at the University of California and San Francisco State College, where he majored in reed, brass and string instruments. He directed the Eureka municipal band, local minstrel shows, and field day parades. He served as band sergeant in World War I, and after the war he organized the American Legion Drum and Bugle Corps in which he was active for many years. He was a member of Humboldt Lodge No. 79, F. and A. M., and of Fort Humboldt Post American Legion. Surviving are his wife, three sons and two daughters.

EDWIN BORCHARDT, 56, member of Milwaukee Local 164, died of a heart attack last month. He was found lying on the balcony steps of the Oriental Theatre, where he had been employed for the past 15 years. He evidently was stricken while on his way to the projection room. Borchardt became an apprentice member of Local 164 back in 1917. In 1918 he joined the U. S. Armed forces and served in World War I. Upon his return from overseas he resumed his apprenticeship in the Local and in 1922 was accepted as a full-fledged member. His sudden death was a shock to his brother craftsmen. He was unmarried and his survivors are several cousins and distant relatives.

FRANK M. DELORENZO, member of Milwaukee Local 164 since 1912, died several months ago. He was very active in the affairs of the Local and served in various official capacities. At the time of his death he was employed at Stanley-Warner's downtown Alhambra Theatre in Milwaukee. He was one of the real old-timers in the movie industry, having worked as manager for the Selznik Film Exchange in Milwaukee and Omaha, and also as a salesman for Metro. Many years ago, he and his brother John, also a member of the Local, operated the first poster mounting service in Milwaukee and Minneapolis.

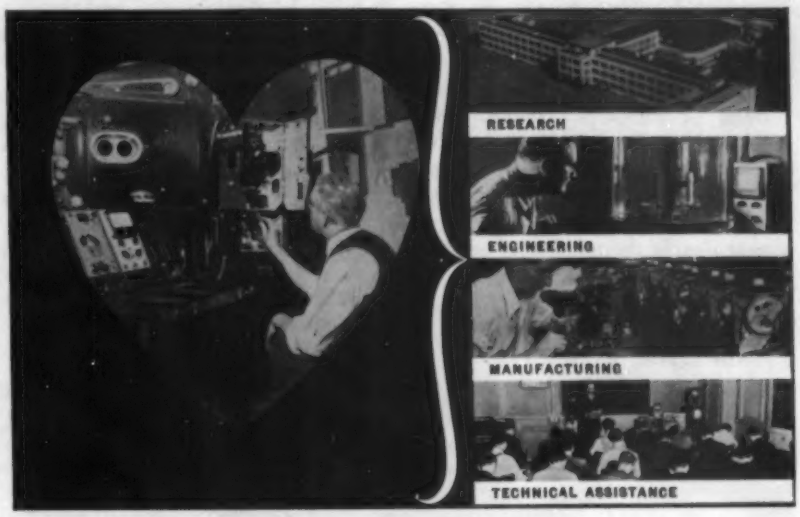
Frank DeLorenzo was noted for his wit and great sense of humor. He was praised for his hospitality and was at his best when entertaining his many friends at his home. Survivors are his wife Mabel, one son Comm. Frank L. DeLorenzo, USN, now stationed in Trinidad, B. W. I., four brothers, and one sister.

ARTHUR C. WARD, 41, member of Local 396, Binghamton, N. Y., and projectionist at the State Theatre in Union District, died December 23 of a heart attack. He was a veteran of World War II, having served in the Asiatic-Pacific theatre. He was a member of Maj. Ray Humphrey, DSC., Post 1449, VFW of Endicott, N. Y.; Loyal Order of Moose 1065; Fraternal Order of Eagles, Aerie 2269, and of the George F. Johnson Post 1700 of West Endicott. Survivors are his wife, two daughters and three sons.

CHARLES E. MASON, 74, charter member of Local 253, Rochester, N. Y., died January 18. A native of Rochester, he joined the Local in 1904, and for 20 years was projectionist at the Temple Theatre. When use of the Temple was discontinued several years ago, he became projectionist at the Regent Theatre. He was an expert craftsman and often was called upon to create special lighting effects for shows playing in Rochester. He also was projectionist for the Memorial Art Gallery movies. Survivors include his wife, one daughter and one son.

Tape Men Organize

Formation of the Magnetic Recording Industry Association is announced with Joseph R. Hards, of A-V Tape Libraries, New York, as president, Russell Tinkham, of Ampex, vice president.



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BACK of every RCA Theatre Service engineer are all the resources and facilities of the Radio Corporation of America. No technical problem in theatre sound or projection is too difficult for RCA Service engineers to tackle and solve . . . for YOU!

For over 25 years, RCA Theatre Service has been consistently of the highest quality . . . thoroughly dependable . . . and friendly.

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Clayton Ball-Bearing Even Tension Take-Ups
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Canada Doubles Number of Theatre Seats

THE MOVIE business is booming in Canada with new drive-in theatres accounting for a good portion of the gains noted for 1953. According to statistics compiled by *Canadian Film Weekly*, Toronto, 123 new theatres appeared in the Dominion last year — 78 drive-ins and 45 standard theatres.

In addition, 26 new theatres, including 16 drive-ins and ten standard houses, were under construction at the end of the year. Thirty-three theatres, including 14 drive-ins and 19 standards, are on architects' drawing boards.

Figures released by the Dominion Bureau of Statistics, Ottawa, when combined with data published by *Canadian Film Weekly*, show a really amazing gain in motion picture theatres during the past 15 years — almost double the number of seats in that comparatively short period.

In 1938 the seating capacity of all Canadian theatres, according to government figures, was 658,174.

At the end of 1952 seating capacity was 1, 106, 316, including some 16-mm seating, a jump of 448,142 in 14 years. To this add *Film Weekly's* figures for the 1953 gain and we have an approximate 1,206,000 number of seats, almost double the 1938 figure.

While some of the gain may be put down to the addition of the former Crown Colony of Newfoundland to Canada as a tenth province, it is pointed out that this is but a small factor. There are but 28 theatres in the new province and the seating capacity is well under 15,000. The largest theatre on the island is the Paramount in St. John's, 1,195 seats, followed by the York, also in St. John's, with 1,100 seats.

The figures are all the more remarkable when it is remembered that the period from 1938 to 1953 saw great expansion in the radio and television fields. Canadian film men, it is pointed out, do not seem to fear the impact of television as a rival.

As one Canadian projectionist put it when he visited IP's office in New York:

"This is good news for the boys in the projection rooms. Every new theatre means more projectionists."

PAT ON THE BACK DEPT.

To the Editor of IP:

. . . If I may, I'd like to commend you on the material and on the various topics covered in your publication. It should be a weekly magazine. It seems too long between issues. I'm always looking forward to the next one! Keep up the splendid work!

PETER R. SADESKY
Secretary, Local 461
St. Catharines, Ont.

Mobile Cinerama Camera Unit

The first mobile camera unit for the production of the next Cinerama production, "The Thrill of Your Life," has been delivered to Cinerama's Oyster Bay, N. Y., headquarters. The unit consists of three large trucks, the first containing Cinerama's triple camera, the second, the stereophonic sound equipment and the third for general utility. The first unit will be used by producer Louis deRochemont in Europe. A second group of trucks will soon be ready for use in the United States.

New Industry Museum

The old Warner Brothers studio on Sunset Blvd. in Hollywood, regarded as the birthplace of the talking picture, will soon become a combination television center and museum. The property has been sold to Paramount as a future home for its Los Angeles Tv station, KTLA. Paramount has agreed to make a portion of the building available to the Motion Picture Relief Fund for the establishment of an industry museum.

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PENSION PROTECTION

(Continued from page 19)

Aside from the question of greater expense, there are certain advantages in hiring an independent actuary rather than relying on an insurance agent. The professional consultant will not be interested in selling any particular product or type of plan as against some other plan which might be better adapted to the needs and desires of the group. He will be on hand for consultation, to answer technical questions and to give advice if needed, at the time it is needed.

Local unions that are about to negotiate a retirement plan should consider the possibility of an arrangement with the employer whereby they might jointly engage an impartial actuary to provide the necessary cost estimates, and to whom technical questions might be referred by both parties. If relations with the employer are such as to make this possible, it would certainly be the most economical approach.

If this is done, care should of course be taken in the selection of the actuarial consultant. Private consulting firms have generally in the past derived most of their revenue from employer business, and many — if not most — of them are well saturated with the employer point of view. However, there are a number of consultants that do a good bit of trade union as well as employer business and are equipped to provide thorough, fair and impartial service.

Before the cost of financing a particular plan can be estimated, the actuary or insurance company must have certain data on the workers who are to be covered by the plan. The following facts on each individual worker in the group to be covered by the plan should be collected: (1) Rate of pay (if the benefits of the plan are to be related to earnings). (2) Age. (3) Sex. (4) Seniority or past service (if the benefits of the plan are to be related to service.)

Employer Cooperation

Local unions should, in most cases, be able to get this data from the employer, who will probably have it readily available in his files. If, for any reason, this information cannot be obtained through the employer, the union can make up cards with blanks for the members to fill in with the data needed.

To figure out how much money must be in the pension fund when a worker reaches retirement age in order to guarantee his pension for life, the actuary makes an initial assumption as to how long the worker is likely to live after retirement. To guide him in making this assumption, he has at hand a mortality table which shows the average future life expectancy of an individual at all various ages.

One table in common use at the present time is the so-called 1937 Standard Annuity Mortality Table. According to one table, the average male at age 65 can expect to live 14.4 years longer. The average female at age 65 can expect to live 17.55 years longer.

Interest Cuts Cost

If the rate of pension for which a worker qualifies at age 65 is $1,000 per year, the fund must be large enough to provide him with a total of $14,400 in income from the time of retirement until his death, when the pension will cease. This does not mean, however, that the pension fund need contain this full amount at the time he reaches age 65.

As previously mentioned, the actual cost equals benefits paid *less interest.* A portion of the pension will be paid out of interest earned by the residual part of the fund during the period of his retirement.

If interest is earned at the rate of 2%, for example, then a fund of about $12,400 will be needed to pay a pension of $1,000 a year beginning at age 65. If the rate is 3%, the same job can be done with about $11,550.

[TO BE CONTINUED]

Cinerama Earns $6,500,000

Gross receipts of approximately $6,500,000 were earned by "This Is Cinerama" in the period between its opening in September '52 and January 1 of this year. The film, which is the first picture made for the Cinerama medium, is now playing in nine cities and was viewed by 3,500,000 before January 1.

Billion for Broadcasters

The broadcasting industry may achieve its first billion-dollar gross-income year in 1954, according to an announcement by the National Association of Radio and Television Broadcasters. Tv is expected to gross over $500,000,000 with radio running very close to it.

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PROJECTION LENSES

(Continued from page 8)

flanged guide-rollers. Long-focus lenses tolerate these defects rather well, but short-focus lenses show them up as out-of-focus areas on the screen.

It is easy to see that projection lenses work under handicaps that are so variable that the lens-designer can do nothing about them. Also, a projection lens must have a large diameter to provide efficient illumination of the picture on the screen. A cameraman may sharpen the image-definition of his short-focus ('wide-angle') lenses by "stopping" them down to a smaller diameter and increasing the exposure-time by adjusting the shutter to compensate for the loss of light. The projectionist cannot do this because his shutter already works at maximum efficiency. And even if it were possible to speed up the action of the intermittent sprocket and to narrow the shutter blades, stopping down a projection lens increases the "vignetting effect" of optical mismatch between arc-mirror and projection lens.

Best None Too Good

No compromise of projection quality, and hence of lens quality, should be tolerated. New lenses of high quality are costly, and yet no theatre can afford lenses which are not the best. It would be a wonderful thing if the different lens manufacturers could pass "sample" lenses around to theatres where old, uncoated lenses are still used. Projectionists and exhibitors alike would be amazed at the difference.

In every case new lenses should be tested under actual working conditions in the theatres. The first part of the test should consist of a careful visual examination of a focus-target test film, preferably in loop form so it can be kept on the screen as long as desired. Center and edge areas of the chart should have very nearly the same focus, definition should be sharp and brilliant, and there should be no trace of haze surrounding bright areas. Plain black-and-white titles provide excellent test films for detecting haze.

With a new lens in one projector, an old lens in the other, and identical focus-test loops running in each, rapid changeovers will show up the differences in the two lenses. To eliminate the effects of accidental gate misadjustment in one of the projectors, the lenses should be interchanged and the test repeated.

"Control" Testing

The second part of the test involves projection of an entire show, first with the old lenses and then with the new ones. The edges and corners of the picture require close examination; but failure of the lenses to resolve these extreme areas may be due to mechanism defects. The projectionist should merely keep in mind the results obtained with the old lenses and judge the new lenses on this basis.

"Fast" lenses having speeds of F/1.9 or more were introduced in an attempt to obtain more light on the screen and greater uniformity of illumination. It is our own opinion that the new speeds are very desirable in focal lengths of 4 inches or greater, and introduce no serious operating difficulties on account of their slightly smaller depth of focus. In the case of lenses having focal lengths shorter than 4 inches, however, too great a speed, or lens-diameter, may make good focus impossible.

Now, the slower lenses (speeds of F/2.5 or F/3.0 are not necessarily "old-fashioned." Many of the pre-war lenses are outmoded simply because they are uncoated; but modern improvements in optical glass, lens-design, and coating methods benefit *all* projection lenses of recent manufacture, slow as well as fast. It is well known that the slower lenses are more fully corrected, and that they have a greater depth of focus. They give clearer, if less brilliant, pictures. The differences, however, are so slight as to be virtually non-existent in the longer focal lengths, and become really serious only in the extremely short-focus lenses required for large pictures at relatively short projection throws. The fast lenses, as we have said, make possible brighter and more uniformly lighted pictures.

[TO BE CONTINUED]

'Scope on Standard Film

A satisfactory method of optically reducing CinemaScope film to standard size has been developed at the West Coast laboratories of 20th Century-Fox, but in accordance with company policy, these standard prints will not be made available for exhibition.

The system developed by Fox provides a standard print framed in an aspect ratio of 1.75 to 1 which is said to hold picture area loss at side, top and bottom to a minimum Perfection of the method eliminates the need to actually photograph a standard version of CinemaScope pictures. Studios have been photographing CinemaScope in duplicate with both anamorphic and standard lenses. None of the standard prints have been released as yet but Warners is rumored to be planning simultaneous release of both types of print.

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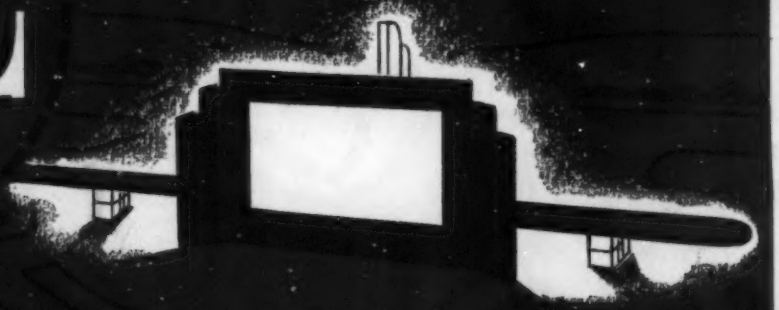

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